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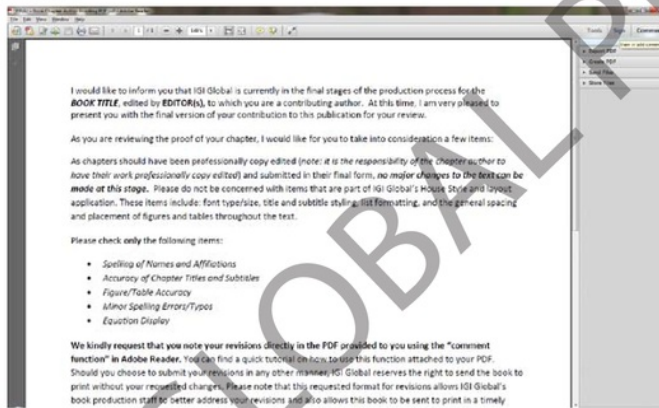
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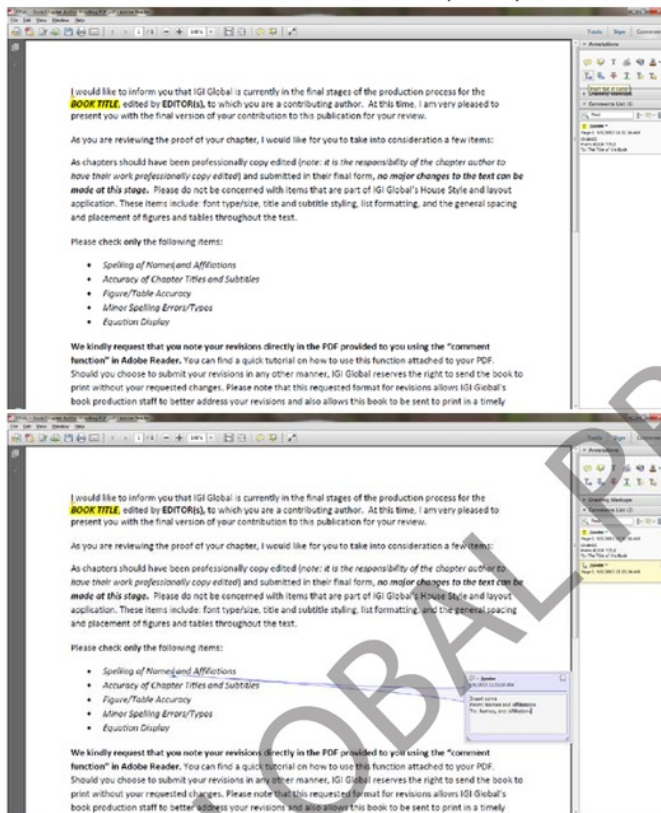
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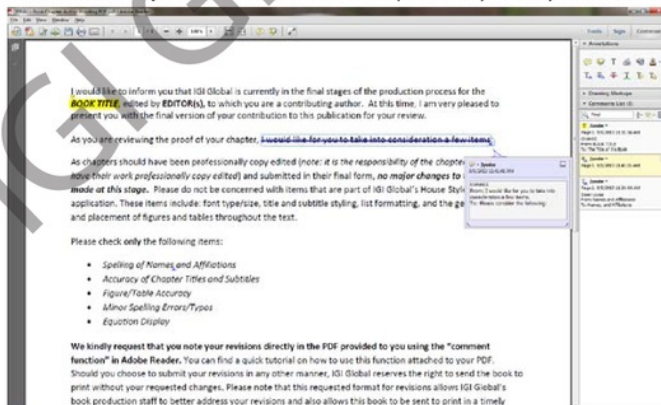
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# Chapter 8

## Adaptive Online Learning Technology: Trends in Big Data Era

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### ABSTRACT

*The current trend of technology advancement with digital devices such as smart phones, tablets, and laptops has shifted the way of societal life including teaching and learning. This initiative might also contribute to the typical approach of ICT (information and communication technology) to increasingly enhance the achievement through utilizing it in the education setting in the higher education context. Adopting social media in network data massively within the big data trends, the extraction of*

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*the particular means in providing structured data from enterprise resources data and sources of unstructured data from audio and video can begin with providing the value from information space such as message, conversation, transaction, and other sources. This chapter attempts to explore the design for teaching and learning in big data approach. Attempts to achieve particular advantage of big data with analytic process could provide the innovative environment of adaptive online technology to enhance pedagogy and technology skill to support the initiative way of teaching and learning process in the higher education (HE) context.*

## INTRODUCTION

<sup>1</sup> In the past few years, attempts to utilize the technology development such as smart phones, tablets as well as laptop have a wide chance in promoting an appropriate way to improve effectiveness and efficiency of practices on teaching and learning in higher education (HE) (Ahad, Anshari & Razzaq, 2017; Borés, Saurina & Torres, 2003). In this regard, the advancement of technology devices initiated to supply the human interaction basis should bring along with bridging the attempts to promote the practices with appropriate way. In terms of pointing out the worldwide to improve the quality of learning process through emerging the online learning with the approach in considering the way to facilitate multiple sources for the information, attempts to fulfil this inquiry should be acquainted the needs referring to their demand to be given into the learning and teaching material resources. With regard to the initiative in utilizing digital devices to be cooperated into the wide range of teaching and learning in HE context (Almunawar et al., 2017), this facilitation has to be involved into online learning basis referring to give insights with committing to assess online resources along with enhancing the learning design recommended to support the entire initiative in the attempts with a better service to transform the material sources to entirely engage in providing a wide range of task configured into an attempt with the necessary response in the management of educational process. Referring to the online-based learning and teaching with innovative strength and awareness of careful competencies transmitted into HE context as an attempt to enhance the commitment to fulfil the inquiry based on the learning process, it is necessary to explore in getting the resources in the way which can facilitate their learning in terms of material sources. Among those platforms, which could easily give the support, one of them is the framework of big data adopted as a new technological approach. This can be supported easily in attempting to get information from the multiple sources in using big data platform through existing recommendation approaches to address learning sources. It can give insights into providing the feedback with the process considered especially in enhancing innovative learning performance to ensure the

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students' learning in searching for resources with borderless space (Ertmer, 2005). Moreover, this attainment would give insights into the learning material resources in the sense that the platform is entirely managing well.

In addition, the practical stage conducted from the advancement of Information and Communication Technology (ICT) in the attempts to maximise the advancement of big data analytics process refers to design the particular task with the process to adopt this initiative transmitted into the societal demands and needs. Those concerns are communication purposes in teaching and learning and also the business. With regard to the practical stage to give insights into the standard in utilising it to enhance in increasing the growth of knowledge productivity to reach the advantage of running the process with the competitive achievement, adopting the big data analytics framework needs to proceed the procedural stage to assist the entire initiation referring to ICT adoption (Almunawar, Anshari & Susanto, 2018; Huda et al., 2016a). Attempts to adopt the technological device with big data framework could be enhanced to generate the massive data incorporated into the platform which can support the learning material resources. By adopting this significant platform tool, attempts with an innovative approach from many aspects of devices would be enhanced in incorporating the massive data in supporting the interactive learning environment.

In line with conceptualising big data analytics process, the needs to adopt the strategic plan to commit in absorbing the point of view on massive data absorption to begin with maximizing the beneficial value of digital devices in the attempts in elaborating the basis of information systems should continually be engaged into determining the particular task with a serious effort in enabling the learning process to run well. Through giving the strategic plan with continuity in the process of the actual performance in the higher education (HE) setting, this feedback could be taken consideration as an attempt to actually enhance the performance of innovative learning. At this point of view, the entire enhancement to give a beneficial value in transmitting the feedback on the learning in the context of borderless space is entirely a pivotal role to be recognised as the new approach of technological basis with big data analytics framework. With this regard, enabling the learning process where the students can manage their own personalised learning (Huda et al., 2016b; Sabani et al., 2016), attempts to incorporate the dynamic aspects in the way to manage the massive data by searching for resources for instance would have a good chance in making learning environment innovative and interactive. In order to achieve this attainment, making the procedural stage through the theoretical framework in underlying big data analytics process could be enlarged in gaining the demands referring to the basis of teaching and learning. It indicates that the attempts to elaborate massive data generated with growing terms of performing them enjoy enable students with enhancing in terms of supporting learning environment. Moreover, the technology

tools should be transmitted into involving the resources through online basis in the basis of big data adoption (Huda et al., 2017a). Since there has been lack of scholarly attention to elucidate learning basis of environment to assist in providing the learning resources, this chapter aims to explore the analytical approach of big data in giving insights into the adaptive learning technology. In particular, incorporating the framework of big data to utilize a wide source of information and knowledge in HE context, creating innovative learning should be aligned with designing big data integrated into the specification referring to underlying the learning process.

## **LITERATURE REVIEW**

### **Big Data Emerging Technology in Education**

As the platform in generating the information from transmitting the massive data obtained from the user's pattern in the digital devices like tablets, smart phones, and laptop to be used in social media such as WhatsApp, Facebook, LinkedIn, the huge amounts of data can be signified into the numeric figures in order to extract the value of social network (Huda et al., 2017b; Mayer-Schönberger & Cukier, 2013). Gathered particularly from collecting the huge amount of data from the sources whether it came from traditional basis and digital one, the process of generating the platform to manage the way in the basis of the computing technology could basically be transmitted through the social media platform (Chen, Chiang & Storey, 2012). This view aims to enlarge the potential abstraction to be gained among those digital devices being used to deliver the information and news (Chen, Mao & Liu, 2014). Then, there can be detected to gather the pattern in terms of the particular theme which can be exerted with more complex and larger use. It can be managed through a wide range of computer, mobile phone and laptop (Huda, 2018a). In the attempts to manage and analyse massive data amount, emerging technology of big data with adopting such extra tools could be enhanced to obtain the value through generating both unstructured data including unorganised information interpreted easily like pictures, documents, videos, and also social network site like twitter, Facebook and WhatsApp, and structured data coming from wide range of the interaction carried out among the users with machines such as web application use. In this process, the big data analysis with the attempts to settle such kind of several difficulties together with the complexity needs to entirely be analysed through interpreting wide range of different ways in the way to transform the massive data. As a result, attempts to obtain the combination between interaction and application have to be involved with enhancing the use of volume, velocity and variety (Villars, Olofson, & Eastwood, 2011). This initiative would give insights into assisting to adopt the generated data

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which can be assessed through delivering the pattern from the communication and information delivery through the social media tool. In order to achieve this benefit through the supplying system in terms of demands and needs into the organization, the attempts to consolidate the assistance with handling the massive data could be signified in generating the internet platform. With regard to introducing the two characteristics involving complexity and variability adopted to analyse data appropriately in order to give insights of big data emerging technology, these components would be fitted to the beneficial purpose to emerge the information pattern along with the extent of communication integrated into the enterprise digital software.

In addition, the initiative with the particular attainment to get benefit in the way to transmit the convergence of data from such digital tools like telephone lines or wireless signal would be used in assessing the store which could be transformed with using the link system. This system is actually a part of such large device which can be carried out in enabling the society to do the potential view to transfer data information to work based on the demands. In order to transform this potential value into facilitating the learning medium within the educational setting, the model designed from collecting, aggregating and analysing very large amounts of data is generated into the technologies and architectures with its new generation in the attempts to utilizing massive amounts of data created every second across the internet (Mayer-Schönberger & Cukier, 2013; Villars, Olofson, & Eastwood, 2011). In this regard, the effort to with the relation to innovative online learning setting such as fine-tuned to large data collection to maximize its potential could be adopted into the competencies basis between teaching and learning. Moreover, the consequence to get adoption through adaptive teaching competencies and learning adaptive technology in big data era for instance would become an entire potential insights to enhance the innovative performance skills to be employed in the higher education (HE) setting (Huda et al, 2017a). Referring to the distinctive feature of innovative teaching in giving the priority to be applied amidst the learning-teaching basis needs to concern pattern used through smartphones in the classrooms for the learning aid is one of such features which can be gained in further to see the design for adaptive learning technology model (Anshari et al, 2017). Through gaining the extraction to utilize the massive data amounts delivered through multi channels, this initiative could give insights into the basis of learning activities in emphasising pervasive learning anywhere and anytime (Anshari et al., 2015).

Through promising the extended benefits from traditional learning basis to the modern learning basis with collaborative centre, the material sources in this view would be significant to supporting the technological tool platform with being sufficient to enhance in influencing the effectiveness of learning (Huda et al., 2018a; Huda et al., 2018b). With the availability of big data based in supporting the academic skills and social interaction, the learning basis with emerging forms

of activity in the effort to enhance and extend existing classroom practice should emphasize the potential enhancement on the use of big data to taking accounts in both complemented and modified practice. In order to provide learning approach through such indicators through maximizing online resources towards big data analytics framework, the effort in checking on the voluntary data would be assessed to support in providing the good potential sources within the educational levels in enabling the learning process with particular skills and interest among the students (Anshari et al., 2016; Kitchin, 2014). Transmitting the basis of massive data from the track records including communication, interaction and others should be engaged into the attempts in expanding the extent of underlying the entire process of managing the learning process. Moreover, the model of communication platform which can be recorded through enterprise software such as telephone lines and wireless signal could be integrated in the way to apply in transferring information data in enabling the society in the way of running their needs basis.

### **Pedagogy and Technology Skill for Innovative Environment in Teaching and Learning in HE Context**

One of the important parts to enhance teaching and learning is the integrated attempts to strengthen pedagogy and technology skills. These two parts have been knowingly significant to give insights into the environmental basis in the sense that can be involved into both strategies and capabilities. In this view, these innovative skills have to be determined in supporting teaching and learning in the digital age in underlying the environmental basis. As a result, the strength of pedagogy and technology should be addressed in the basis of online learning to enlarge the system of information in terms of strategies and capabilities in a way which can be configured into the performance along with teachers and learners. This initiative refers to transmit teaching and learning which will give insights into innovative learning environment (Anshari et al., 2017; Maselena et al., 2018). Interactive innovation of learning environment could be achieved through applying for technology and pedagogy integration configured into the rules transmitted in the curriculum basis (Anshari & Alas, 2015). In particular, this attainment would be carried amidst the entire cooperation between the users and their performance way where this is involved in enhancing the material resources for online learning. The particular type of this learning enhancement becomes a core point of view in the education sector in order to run the process into widely supporting the learning process through providing the online learning material resources (Anshari, Alas & Guan, 2015; Huda et al., 2018a). In the attempts to adopt the potential value of online resources through employing the process together with the stores assigned into the material resources, addressing the strategies shared in the basis of enhancing the

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pattern of teaching and learning more attractive with a wide range of collaborative initiatives becomes fascinating in the sense which can perform in disseminating educational material based innovative environment in facilitating the processes and stores. Moreover, this would attempt to adopt the strategies which can be employed to support the administration procedure with the communication configured into teaching and learning (Ertmer, 2005; Huda et al., 2018b; Ma, & Harmon, 2009). Through signifying the course materials, attempts to run the procedural context in the online learning process can be managed to distribute the point of view with the initiative through management, distribution, and retrieval.

In addition, the entire process of configuring online resources in the sense which can signify the process itself into the information systems needs to bring along with the attempts to the records management well applied in supporting the teaching and learning process. Through convincing the efficiency basis in underlying teaching and learning, this initiative refers to accommodate dynamic interactive with regards to the attempts to establish the basis of alternative learning experiences which can be transmitted among the students. In this view, knowledge management in the attempts to incorporate learning sources associated into the wide range of social networks and multi-channels should be determined into generating the comprehensive requirements of the process in providing learning experiences (Hashem et al., 2015; Huda et al., 2016b). In considering the initiative to generate big data emerging technology, understanding the adoption in using technology with a wide range of assisting the framework of dynamic tool needs to be applied through big data integration. This integration should be complied with cloud computing basis which is necessary to transmit in enhancing the skills development pointing out the emerging technology assigned in supporting adaptive learning technology together with performance and competencies of teaching (Hixon et al., 2012; Huda et al., 2017b; Huda et al., 2018a). As a result, this initiative is needed to enhance the entire combination among teaching skills together with adaptive learning to lead to point out the material resources in improving interpersonal skills. Since this potential value of pedagogy and technology skill for innovative environment in teaching and learning (Huda et al., 2016d), it is necessary to enhance the experiential basis of teaching skills which is potentially integrated to enable the learning process to yield the myriad of useful resources. The resources should be prepared with creating the learning culture to possess the dynamic integrity assigned to the ethical consideration in terms of adopting the content with the procedural stages in the management process (Huda et al., 2017c). In particular approach, the culture of sustainable learning in understanding the good means needs to expand the basis of academic performance combined into the dynamics of learning in the learning process. It could enable the students to attract particular attention with the entire awareness towards their environmental sphere. Some significant attributions which have contributed to

enhance the knowledge sharing in the learning process should do with addressing the outcomes basis within the academic performance (Huda et al., 2016c). At this point of view, attempts to carry out the engagement of the stage to integrate the multimedia presentation including power point or video presentation across internet sources could be a pivotal opportunity in maximising the use of resources from the wide range of platforms. This opportunity refers to inevitably disseminate the integrated dynamic value to generate the learning process in achieving teaching and learning basis to build the quality into innovative environment of online resources.

In line with accommodating the expansion of beneficial value of online resources across teaching and learning in digital age, the attempt to generate the personalised learning (Sabani et al., 2016) and sustainable basis (Huda et al., 2017e), for instance, needs to be transmitted among the teachers and learners to significantly give insights into realising the benefits of adopting it into the higher education (HE) context. With this regard, being an entire opportunity to enlarge the component of learning and teaching points out interactive multimedia online needs to bring along with adopting the learning styles to underlie the wide ranges of needs for teaching and learning purpose. In order to meet obtain this achievement, it is necessary to address the needs and demands to generate online resources with pedagogical skills mainly in digital age in enabling the process of teaching and learning more convenient. Through providing the gateway with a whole level of learning to show the data sets or podcasts to underline the wide range of learning styles, teaching process should emphasise the experiential expertise configured into the video presentation for instance together with addressing individual online interaction (Huda et al., 2017d); Ma & Harmon, 2009). This initiative aims to support the basis of technology enhancement assigned into the online resources through a wide range of digital devices such as smartphones, computers, cameras, tablets, within the digital platforms like networks and social media platforms, etc. (Puzziferro & Shelton, 2008). Integrating the learning activities including curriculum, lesson plan and also subject expertise would enable the online resources to be potentially adopted to transform across the skills development and management process. As the initiative through the integration of the learning activities in making successful by accommodating the online resources types in the data base, attempts to access the progressive enhancement to transmit the professional basis in the combination between the teaching management and medium of online electronic message in the way to get information data to cover such space, time and frequency in the basis of availability and accessibility of online resources. With regards to point out mode of convenient enhancement to adopt the online resources in anytime and anywhere, it should be arranged the knowledge construction which should construct the ICT advancement in learning and teaching activities. Moreover, the arrangement here refers to the knowledge construction in the basis of the massive pervasive knowledge

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which may possibly be integrated into technology device accommodated through online platform such as online learning. The combination of using digital device to support the virtual-based learning and teaching is actually the potential value to transfer knowledge within innovative environment as an attempt to deliver the information process through pedagogy and technology skills.

With this regard, the potentials with the digital technology use associated with pedagogical approach in the context of virtual basis should be committed to incorporating dynamic condition to enhance the innovative inclusion on information sources through track record from massive data. Moreover, the unique of combining integral part into learning environment with innovative communication enabling the learners to expand the materials through adopting the digital device and virtual platform needs to explore the extent underlying the interactive practice in utilizing the resources in creating the wide space of learning enhancement (Ma & Harmon, 2009; Othman et al., 2017). With this regard, the way of resulting the value in incorporating social networking platform in the attempts to generate the inspiring and innovative with a significant essence to endure the learning process refers to make the environmental sphere with a more convenience in the sense that can also be committed into the configurations among the learners. This would give a feedback into strengthening the strengths-based learning in particular to behave the environment for innovative learning in facilitating the learners in possessing the condition where they can enjoy learning together with broadening flexibility and connectedness towards information sources in supporting the entire process to enhance the knowledge understanding through self-regulated inquiry. As a result of committing the way to work with peers and colleagues in the virtual basis for instance, this initiative would give a feedback to be engaged into their own learning performance within innovative environment through actively improving the level of knowledge and skills which can be complied in the practice (Page & Thorsteinsson, 2008). With self-regulated inquiry assigned into the way of learning performance, it is necessary to provide a feedback among the students interactive learning by helping to enhance the capture of understanding the knowledge in the attempts to develop the learning activities considered as the opportunities to make an innovative approach of big data emerging technology to create them construct the particular view to recognise principles and regulations largely towards maximising the massive data of information from track record of such activities.

### **Innovative Design of Digital Technology Learning Skills for Adaptive Online Learning**

Conceptualizing the principles together with the relationship of pedagogy and technology enhancement, the needs to make innovative learning design should

bring along with engaging the digital trends. Big data is entirely the trend which gives the platform of massive data from the records of interaction and activities from the users. With regard to the big data approach designed into the innovative learning in gaining the extent of potential value in incorporating the resources, this initiative needs to determine the basis of online mode to lead to enhance the model of online learning referring to pedagogy and technology basis to provide the platform of multichannel in online basis (Kitchin, 2014; Provost, & Fawcett, 2013). In this view, attempts to construct the users to enable them in getting the resources from wide range of channels should combine the procedural stage and implementation basis in order to make sure in getting the beneficial value in the extent which could potentially be transmitted in extracting the massive amounts of data. Thus, it is necessary to provide learning activities in utilizing extraction of massive data amounts as the initiative in making learning with online basis. In the basis of transforming the innovative learning design, considering innovative-based approach with technology and pedagogy enhancement should bring along with addressing pervasive knowledge in the sense that can be transformed into the digital technology learning skills. In particular, the technological based learning refers to achieve an entire extent of beneficial values through providing the academic skills and social interaction (Rahman et al., 2005; Rosli et al., 2018). As a result, the need to strengthen the learning sources in the convenient service with pervasive learning in anywhere and anytime context of learning sources has to do with carrying out the technological device in big data approach (Russom, 2011). The entire attempt to give insights into the learning efficiency and effectiveness should be prepared in particular needs to support the orientation with collaboration initiated to gain the sufficient enhancement in the context of online resources in the sense that can be achieved within big data emerging technology. Through the procedural stage in supporting the effectiveness of learning enhancement with pointing out the particular strength towards the sufficient support through online resources, the extent of availability with the orientation to enhance practical strength in empowering the way to underline the effort should be taken into consideration in a particular way on big data analytics approach.

With regard to managing an attempt to obtain the learning process well referring to the big data analytics process, serious concern should bring along with achieving the collaborative initiative by enhancing adaptive online learning in the attempts to make easily with the entire preparedness assigned into the learning skills with the digital technology. Moreover, the learning sources from the online basis should be transmitted through the digital device and online platform to enlarge the point of view in obtaining the basis of procedural stage in supporting the process itself (Russom, 2011; Zulkarnain & Anshari, 2016). This indicator being part of digital learning designed into the big data analytics process in a whole context could be

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assigned in contributing the combination between digital technology and virtual pedagogy. In order to make the use of the indicators referring to the online sources to show the voluntary data, attempts to engage into preparing the learning process with emphasising the pivotal role to underlie in assessing the practical basis in the context of widening pedagogy enhancement could be emphasised within the particular subject towards gaining the sources of information. Moreover, it should be well complemented in modifying to check the use of data in enabling the students to produce their own voluntary data from browsing internet regarding their learning subject. In this view, attempts to emphasize the interest with the certain topic which could enable in engaging the online learning with its dynamics and condition has to be involved within the integrated systems towards the learning space together with online sources (Maseleno et al., 2017a; Moxsin et al., 2018). As a result, the initiative of expanding an entire integral part of materials in producing the learning space in the extent of recognising the practical basis with an interactive instruction given to enlarge the implementation stage needs to configure the point of view in attempting social network basis through the online resources.

In addition, extending the valuable insights of digital technology skills with committing to practice in the innovative basis through generating the learning environment to support the adaptive online learning should be adopted in the performance based integrity in the attempts to create the inspiring value of ethical enhancement and professional engagement with designing its particular essence of addressing the strengths-based learning. At this point of view, the significant essence of giving insight among the learners to enable them to get active in the course they apply for refers to potentially play a pivotal role in creating the environment to facilitate their learning more well prepared, and thus the outcome based learning could be achieved within the particular enhancement of flexibility and effectiveness (Kitchin, 2014). Towards the significance of achieving the model basis of the flexible awareness, the entire essence to strengthen the work commitment in the extent of connectedness within an innovative learning environment refers the way to support the practical basis in the entire process together with making it well performed within the self-regulated inquiry. With this regard, the process itself needs to prepare the integrated enhancement along with designing the environment basis to create learning more actively into adaptive digital technology and learning skill (Huda et al., 2017e; Nacheva-Skopalik & Green, 2016). Through presenting knowledge understanding in the process of learning together with the powerful skills, exploring the design of big data in ILE initiative needs to expand the opportunities in assisting the learning enhancement with the activities to develop capturing the knowledge in building the conceptualising principles assigned into gaining the extent of innovative configuration between the users and their performance approach basis. The significance in facilitating the learning process through maximising the online

learning basis should be taken into consideration in assigning both strategies and capabilities in the sense which consolidates the opportunities to assist the learning process in transmitting the data sources from the voluntary activities among the users. At this point of view, the need to strengthen the knowledge understanding towards the adaptive digital technology skills in the adaptive online learning refers to strengthen the way of self-regulated inquiry in the extent of taking benefit of massive data information largely through exploring the technology adoption professionally and ethically following the configured information system (Huda, 2018). Through underlining information system which could be engaged into comprehending the particular stage to enhance the way of supporting the process of learning in digital age, attempts to gain the potential value of online resources to achieve innovative learning environment in the way to cover widely addressing process should be included towards disseminating educational material through online basis. In this view, it is necessary to point out the strategies where adopting processes and stores refer to enhance in supporting this initiative by maximising online resources followed by facilitating administration and communication transmitted into teaching and learning.

In addition, the initiation in attempting to further carry out the management system together with distributing and retrieving OLR in the sense which can be adopted into the online learning should be accommodated into the dynamic interactive process. This refers to significantly establish the basis of the course materials recorded from the massive data configuration which could entirely enlarge the information systems within the process in convincing efficient management of teaching and learning basis (Hixon et al., 2012; Huda et al., 2017f). With this regard, the entire system which could be supported into the basis of teaching and learning process within incorporating OLR through preparing the wide range of social networks with the alternative basis of learning experiences among the students. The potential value of generating the collaboration of managing information from massive data to provide experiential learning basis could be significantly enhanced in the attempts to adopt the multi-channels of social networks. This initiative should be provided along with comprehensive requirements of learning enhancement in the sense that is to transmit into the big data emerging technology (...). With regard to consolidating multi-level of dynamic learning and teaching with its principles and procedural stage referring to the big data analytics process, it is necessary to point out the understanding of a wide range of percentages in the way to the application strategy of technology adoption (Huda, 2018). In this view, the operational stage combined into the technology use following the digital-based dynamic device to operate it well needs to improve the enhancement towards the skill improvement in enabling the OLR to be enlarged using the big data framework integrated into assisting the basis of cloud computing to give insights into supporting adaptive teaching performance and competencies. As a result, the need to get the development stage among the social concern and

interpersonal skills should be taken into consideration as the task to enhance the skills together with ethical consideration. This is important to give insights into the experiential-based learning to yield the culture of learning enhancement with the myriad of useful resources (Huda et al., 2017g; Puzziferro & Shelton, 2008). In line with understanding the good and appropriate way with the dynamics of learning in enabling them to have a good cooperation through being aware of the environmental sphere, contributing the knowledge in the attempts to share platform of learning sources has to be involved into the academic performance in sharing the knowledge through integrating the video presentation, internet sources use, and so on. Together with outlining the result of carrying out the engaged basis of this opportunity, it is necessary to expand the OLR provided in the online learning system referring to enhance the usability of resources from wide range of such divergent platforms in achieving the capacity and capability in the quality of teaching and learning. In particular, the environmental basis with innovative empowerment should be engaged into taking benefit of OLR through accommodating the learning and teaching components referring to the interactive online in the attempt to expand the entire opportunity adopted in the higher education (HE) setting.

## **METHODOLOGY**

<sup>1</sup> Proposing the theoretical model framework of reference on the design of innovative learning environment (ILE), this chapter attempts to specifically examine the approach of big data value with its analytics process to transmit the model of adaptive online learning technology referring to big data platform approach. By focusing on the phases of literature analysis to the reference model, researchers build on recent reviews of big data and innovative learning design in higher education settings. The review of literature was critically conducted from peer viewed books and journals using the keyword of innovative learning environment and big data. The critical review process was comprehensively applied referring to the extensive basis. In order to achieve this, gaining the literature was analysed extensively following the interpretation of the findings to propose the theoretical framework model. Through identifying, integrating, evaluating and interpreting the potential value of findings, the necessary point was critically synthesized into the key elements of the literature extraction in gaining the modelling basis on innovative learning in big data.

## **ANALYSIS AND DISCUSSION**

### **Analytic Process for Big Data Emerging Technologies**

Emerging technology with the analytic process of massive data taken from wide range of online platform in transmitting the information refers to enhance the particular approach of the capacity with incorporating data created every second across the internet. The potential value from this initiative would give insights into the approach basis to enlarge the huge amounts of data with the emerging analytics of big data in the extents towards volume, velocity, and variety of data. As a result of discovering and analysing the process of extracting massive data through data analytics transmitted into the value from large volumes of data (Villars et al, 2011). In particular, this setting might be transmitted into the massive data throughout big data analytics process should point out an entire initiative to transmit the value extraction of data information. It indicates that the attempts to enhance the access to extract data among the users' record is necessary to gain the comprehensive approach to put forward activities and communication records. To achieve this, the analytic process should be prepared in the sense which gains the potential value which can be exerted to provide the resources for the learning purpose in terms of their homework and assignment. With regards to provide data sources, generating the analytics process has to be involved into the comprehensive approach through extracting value which may need to assist the track record management throughout the basis of activities and communication (...). As an attempt to significantly support the way to engage in interacting with meeting the needs and demands in the learning process, generating the initiative in putting forward the potential value of the analytics of big data refers to give insights into the conceptual framework with applying for the automate data operation system (...). In particular, this system could have a positive feedback in giving the value towards the interaction records based into generating big data in extracting its value from structured data and unstructured data.

In addition, emerging technology provided in big data analytics process is entirely a point of view in transmitting the extraction process either from structured data source or unstructured data sources. Since structured data sources exerted in the learning process sources derived from the records, financial records, e-library records, web click behaviours, enterprise resource planning (ERP) records, etc., unstructured data sources in the general view could be enhanced from audio, social media platform as the networks interactions, etc. (...). This analytic process should be undergone in underlying big data analytics to transform in predicting the pattern in enabling the learning process through delivering the information source in the sense which can transform the raw data extraction process to make sure of gaining data analytic to be enlarged with exerting prediction and pattern. These

two stages could be enhanced in delivering the service appropriately in the way to offer the personalization about the service to achieve the purpose in gathering the modules in enabling the performance in the learning process. In terms of offering the personalization of service together with customizing the subject of course (Huda et al., 2017f), the intervention in selecting and picking up the module provided in ensuring the performance quality refers to strengthen the way of technological skills with professional and ethical engagement (Huda, 2018). In order to making the platform in producing the data across internet in every second, big data analytics process might give the capacity and capability in exploring the velocity together with variety to expand the process into analysing the pattern which may be formed referring to the needs. With regards to the ability in adopting the particular stage of extending the capacity through analytics of big data, among velocity, volume and variety in the attempts to substance the huge amounts of data can be submitted to form the model of pattern fitting to the specific course or topic. Of course, the module or topic should be suitable with their interest in the sense that is needed with the performance through intervention for instance in giving the notification or alert in discovering and analysing the extraction of the potential value. As an attempt to absorb the pattern to be formed from the big data analytic process (Borés, Saurina & Torres, 2003), transforming the analytic process of big data in attempting the process aligned with collecting, organizing and analysing the large data sets extracted through the data value needs to concisely consider the information associated with the potential value created from uncovering hidden patterns together with pointing out the trends of the market from unknown correlations.

In line with the way to transform in analysing the large amount of data (Boyd & Crawford, 2012), it is necessary to entirely set up transferring the data coming from customers' preferences to be transmitted in sharing big data with analytic process. Setting out making the pattern in order to form the access in gaining the material resources, the strength to extract big data value to assist this initiative is supposed to give insights in supporting the basis of environment interaction on the learning process. This can be viewed from illustrating analytics process of big data approach represented to underlie the design of adaptive learning to engage with assisting innovative environment for online learning sources. This enhancement to achieve the design of learning environment is determined to provide the general concept about big data analytic process as an attempt to generate the potential value to be adopted into the education setting. Both structured and unstructured data sources refer to be determined in giving the value through the process of extraction into the raw data in order to enhance big data to build the pattern from its potential value. In resulting the data transformed into the analytic process, delivering the customization together with personalization, the pattern to be resulted is usually the outstanding value from the intervention in capturing the theme fitted to the needs

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coming from such activities like e-library records, financial records, behaviour of web click and planning of enterprise resource etc. (Hixon et al., 2012; Hoi et al., 2012). In particular, in the analytics process with big data emerging technology, data analytic outcome in the attempts to adopt the particular enhancement of exerting the way in personalising the pattern involved to enable the material resources has to be involved into delivering the information sources (Huda et al., 2017g). The potentials of structured and unstructured data in broadening the material sources in the learning process would give an outstanding value in offering the extensive personalization of customization to contribute the modules provided. Determining personalization to produce the creativity has to provide well into the planning to expand the high quality performance in transmitting the advantages together with conditions and limits in the basis of smart context. Thus, the interactions from the social networks to form the wide pattern through the prediction should be engaged in delivering the service in the attempts to the extent of customizing to value extraction to be transmitted into the interventions appropriately in making the quality performance towards the particular course taken during the process determined into developing creativity along with preferences properly exerted in implying the big data analytics.

### **Innovative Design for Adaptive Online Learning Technology in Big Data Approach**

Innovative design which may be proposed using big data analytic process refers to the point of view with a distinct characteristic to transmit the data along with exploring the content as the demand among the users, mainly for the learning resources among the learners (Huda et al., 2018; Villars et al, 2011). An attempt to extract the value through enhancing massive data transmitted into the learning experience could enable the learners in getting access easily through their platform. Through pointing out the basis of massive open online sources with its freely accessed way, the benefit of getting convenient in the same online activities is aimed at assisting the learning model to cover the unlimited number of participants in contributing their task and assignment. As a result, they need to enhance the skills of technology assigned with pedagogy attribution into the basic competency. Through empowering the extent of this competency, the need to arrange the strategic innovation in underlying the way of learning should be considered in particular to enable the learning process in order to effectively transmit the information as the resources which can be exerted to the subject material related to the needs. The availability with easy access becomes the core trend which underlies an initial requirement in enhancing the way of the effective online learning which may obtain the attempts to let the process more convenient through helping the learners in achieving it through the portability using the computer interface design (Huda, 2018). In order to make the potential

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enhancement in determining the usability of a technology-based learning, it can be managed into the model of class or even borderless class in the way which can be applied along with anywhere and anytime basis. In particular, the outstanding value to generate the massive data coming from the number of digital device such as web-based searches, online surveys, online videos, interactive case-studies, and published articles on the web through the class academic-based activities was generated in reflecting the entire attempts to meaningfully integrate into the laptop which can be exerted frequently (Anshari, et al, 2016).

In addition, considering the particular approach of big data analytic process could provide the outstanding value with the entire chances in maximizing the potential of data extracted from the distinct feature obtained through the wide range of platform sources. With this regard, the model design of big data analytic process could be incorporated in online learning systems with referring to the model of personalizing and customizing the services by themselves in the basis of self-inquiry (Huda et al., 2017h; Ma & Harmon, 2009). With regard to offering the customization and personalization of knowledge delivery, each practical stage among the student could be initially applied with more precision in underlying the ability in understanding the students' behaviour through pointing out exploring data. More frequently, they are arranged to make the particular platform which can be managed in the online learning system, so that the relevant material resources would be provided referring to the topic discussion through supplying the relevant links given by the instructor. This process needs to cooperate among all sectors along with giving the better service in providing the useful material resources as fitting to the needs for the subject among the learners (Hoi, Wang, Zhao, & Jin, 2012). As an attempt to particularly transform in understanding the students' record through accessing the resources provided, it is necessary to determine the quality of learning material in order to make sure in developing their module which can be arranged in the online learning system. Moreover, understanding the entire stage by developing the course structure associated with generating the records system of their interaction basis would enable them to have the worldwide-based learning pattern since the resources are in the screen from their portable devices, in that the learners can get the usability of this initiative to enable them get easily access the material sources which they may need. In terms of providing the appropriate content for the learning purpose, the needs to enhance undertaking the activities through wide range of webpage should be professionally trained in the sense that provides a useful module transformed into the effective learning (Huda et al., 2017i; Lyon, 2014). With providing such content appropriate to the learning purpose, the design could be arranged referring to the demand and need so that it can be transferred into the number of activities to generate the data whether they are from volunteering data to the third parties or from the frequent-based learning platform.

In line with transferring these data from the number of interaction and communication they made, the potential value of the extent of volunteering data as a platform to increasingly attract the attention into the big data integration becomes a pivotal value to enhance the skilful competence planned referring to the instructional design model of adaptive learning. In achieving this initiation, it is necessary to recognise the value big data platform offers with regards to integrating the learners' way in the learning process (Huda et al., 2017j; Omar, Kalulu & Alijani, 2011). Along with big data integration assigned with increasing the skills of technology usage specifically in the rise of the internet, the necessary skills should be prepared in the sense to contribute to the particular attainment of the idea initially in focusing on creating the beneficial value which may be achieved with the multi sources data provided along with the research agenda. From the beginning to have a shape in providing the recommendation to propose the model framework, the material resources could be enlarged with big data emerging technology of data analytic process. Moreover, the wide substance in delivering the learning process should adopt the network to get access of data massively from the communication and interaction platform from the social media. It has to be performed in enhancing the particular way to the extracting process towards the massive data coming from either structured data namely from enterprise resources data or unstructured data namely from audio and video (Provost & Fawcett, 2013). In the attempts to provide the information data to extract the value, there can be transmitted from the space like message, conversation, transaction and others, in the sense which can determine the potential value of enhancing to provide the particular means in the value which can be achieved. Moreover, this process would make the design of learning with arranging the extraction of the value from social network in order to have the particular space to the pattern where the sources can be enhanced referring to expanding the process itself. In particular, revealing big data analytic process in fulfilling the learning sources is essentially the worldwide pattern to transmit the data sources through the process of extracting data value referring to the variety and velocity into the volume. Thus, it is necessary to point out using data analytics associated in consolidating to fulfil the way of big data approach in achieving the development process.

### **Strengthening Technology Learning Environment in Big Data Analytic Process**

The entire process of transferring the distinct characteristic using big data analytic can be transmitted to enhance the extraction in the way which can transmit into the data value. In looking at the entire process, the material sources in engaging with extracting the learning referring to the pattern created from both structured

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and unstructured data become a core value with engaging into the potential value of improving the extent of experiential learning. With this regard, online sources can be made from the wide range of massive open data as enabling to freely access towards the convenience about the point of enhancing the participant unlimited number (Livingstone, 2012). Attempts to embark in pointing out the basis of learning through the potential value adopted through working together with engaging the online learning activities should be managed into the competence on technological basis (Huda, 2018). In terms of addressing the value from which the way to manage the learning style is entirely arranged to assist the learners to access information freely, the way to configure the strategic initiation with innovative enhancement has to be involved with analytic process of big data in the sense that can be engaged to find out the necessary basis of the need and demand related to the subject material. In terms of enhancing the information effectively to gather enable finding out referring to their needs, adopting the worldwide arrangement of technology adaptive skills to have access on the resources from any subject is entirely aligned with achieving the easy access available in online basis. An attempt to assist the learning way together with an initial requirement refers to raise obtaining the design of learning through maximizing the potential value transformed from the effective online learning. As a result of enhancing the particular achievement, attempts to make a point of view into the computer interface need to consider the extent of usability in the basis of technology-based learning (Ma & Harmon, 2009). Getting benefit from the potential data to make the resources useful, the design of learning basis has the entire value to transmit the innovative approach to apply for big data analytic process. Along with getting involved into the big data application, innovative approach of reflective practice could be enhanced to transform the essential value in empowering the learning environment actively and innovatively. This would be the worldwide trend necessary to provide the integrated resources in the basis of obtaining the distinct feature in online learning systems.

In line with achieving the approach aligned into interactive technology learning, it is necessary to point out the data sources coming from communication and activities records through the social media platform and other online platform. More frequently, the surveys and also other online platform basis attempt to achieve practical basis of interactive essence configured into the innovative style where this refers to enhance the self-regulated inquiry together with providing an entire element to commit the learning style. Through the social media platform in the attempt to maximise learning material resources, assessing the way to empower the significance of interactive technology learning through big data analytic process is supposed to strengthen assessing material resources more flexible referring to the time and place (Zulkarnain & Anshari, 2016). In order to achieve the learning environment basis, the necessary approach should be committed to ensure in maximizing the significant

enhancement in the way to contribute exploring big data approach to support the process of learning. The initiative to gain multitude resources for online resources attempts to raise achievement in getting more benefits towards determining the guide in enabling them definitely to transform the performance basis in order to encourage them with guiding a way supported in learning instruction. As an attempt to determine the development with the subsequent enhancement of strengthening the control basis in order to make sure its application basis, the way to be taken into account considering the benefit of the entire interaction along with the process has to be involved between the powerful skill and adaptive technology. Referring to the entire interaction in the attempt to achieve ubiquity, flexibility and connectedness, the learning style should be more actively engaged to encourage in getting the way entirely with instructional process in improving the creative skills. Through pointing out the confidence to raise the skills of learning enhancement, adopting big data analytic process might be a pivotal role consequently with maximizing the approach actively into presenting the skill and knowledge basis. The attempt to boost the skills performance to give insights into the online learning basis is fundamental to underline high-quality information within integrating the control basis (Nacheva-Skopalik & Green, 2016). The learning environment in this stage has to do with the effort of engagement including meaningful learning with its application guideline in the sense that can be managed into the learning process in enabling the students to perform interacting with such distinct kinds in the following extent interaction. Generating the valuable insights in the way to introduce, prepare and manage the skills integrated into the arrangements of innovative basis on learning enhancement, the subsequent extent in the learning approach within online basis should do with providing better facilitation on the activities to enhance the convenient way of learning style. Considering the learning approach more upgrade to possess the implementation basis in improving the skills in big data analytic process, it is necessary to entirely facilitate the usability as a result of the learning process with the support of technological tool. The entire approach is required to implement the learning process in the way to cover the technology platform prepared with the multi-place referring to enhance the development of students' performance in adapting big data approach (Anshari et al., 2016). With this regard, integrating learning process in the basis of data-informed in assisting it into the learning environments can be achieved to deliver the information on subject material in helping to get access among the students in the way which enables them to support their activities.

In order to assess the learning process, getting the chance in the attempt to see the abilities aligned to utilize such online resources should be obtained through the adaptive technology skills (Kitchin, 2014; LaValle et al., 2011). The way in the attempts to obtain the feedback transmitted to influence the behavioural basis to give a feedback in influencing the behavioural- based learning process has to be

appropriately designed with recognizing the learning outcome. In terms of preparing the curriculum design in the learning basis, extending the attempts to perform the procedural stage of performances should be prepared by aligning the extent in terms of providing the environment with addressing the outcomes-based learning. With regards to support the learning process, it is necessary to address the entire procedure with the result of determining the interaction with meaningful learning particularly in the way to enhance the process through strengthening the learning outcome. This initiative could be provided in addressing the core priority on the self-regulated inquiry by focusing on the ability to strengthen the interactional strategy to adopt the learning environment with the virtual basis (Huda et al., 2017c). Moreover, the particular advantage needs to take benefit through pointing out getting access on the online resources should be configured into the entire process in the way which has the innovative way together with a distinctive orientation to make the learning more convenient. The core point of view set out designing the adaptive learning skills in the learning enhancement needs to transform the innovative learning in the way which enables the learners to engage into the learning outcome basis which is significant to help improve the attentiveness in the learning process. In particular, the basis of integration between knowledge and skills refers to deal with allowing them to have a better integration within adaptive learning technology through big data analytic platform (Huda et al., 2016a). It refers progressively to strengthen the skills with technology platform in the sense that can enhance the adaptability on self-regulated inquiry. As an attempt to maximise the potential enhancement in the learning process, strengthening the self-regulated inquiry could be enlarged with the raise of performance developed in pointing out innovative configuration, interactive practice, flexibility, ubiquity and connectedness (Huda et al., 2018a). The ability awareness and the learning performance would lead to enhance the necessary point of empowering the basis of innovative approach towards the learning preferences (Othman et al., 2016; Moksini et al., 2018). With regard to enhancing the achievement of learning process, technology skills and pedagogy should be prepared in the basis of performance through providing the feedback to perform the design of interactive technology learning environment. Such indicators of learning enhancement refer to the learning process in the way to go beyond the progress through absorbing the information configured into the process and outcome.

### **Innovative Environment for Adaptive Online Learning Technology in Big Data**

Considered as big data emerging technology in the extent of innovative environment basis, it should be underlined that learning interaction has to be distinctively engaged into the support in enhancing the way to transmit the platform with an entire process

to extract the social network in engaging the learning sources. Through appointing the pattern from transferring the data value, both structured and unstructured data here could be extracted in the way to resulting the potential value of each content from wide range of social media platform (Kitchin, 2014). In particular, it aims at enhancing the extraction process in the way to adopt the basis of massive open data from the value of potential content in improving the experiential learning basis in the regards to enable the learners in getting access on online sources freely (Anshari, Alas & Guan, 2015). Moreover, the particular enhancement to generate the adaptive learning environment could be transmitted in the basis of enhancing the big data analytic process in underlying the learning process through providing the online learning resources. The wide range of significances coming from the convenience can be managed with working together in the sense that can be engaged into addressing the point of view about the technological competence basis. As a result, the learning style managed into the innovation in the way to assist the learners with the strategies configured to effectively reach their needs is necessary to look into the interactive basis of technology adaptive skills. This initiative could enhance the information sharing in enabling the particular enhancement on the online activities deployed with providing the learning material resources (...). In terms of assisting to accommodate the raise of potential value on online activities, finding out unlimited number would be significantly engaged into helping to raise the learning performance through maximizing learning resources online. As an effort to accommodate this initiative towards configuring any subject aligned to achieve the effective online learning, the entire assistance in the way for the usability should be enhanced with the easy access on helping the particular achievement into the technology-based learning. This refers to an initial requirement in pointing out both process and management skills set into the application guideline to support the human awareness in assessing the sources of multi-channels as the knowledge understanding to obtain the model design of computer interface. It can be initially enlarged through attempting the design to guide in driving it appropriately in making useful about the potential data (Huda et al., 2016b).

As an attempt to take benefit about the big data analytic process, the application of learning style involved into designing the basis of innovative learning with interactive basis needs to transform the reflective essence in empowering the environment with learning initiation innovatively in providing online resources platform (Huda et al., 2018). With regard to attempting to get learning enhancement through providing the opportunities in the way to maximize the potential data value collected within big data approach, attempts to obtain the distinct feature in online learning systems refer to the pattern integrated into the model of learning innovatively in transforming the interactive practice configured with self-regulated inquiry (Huda et al., 2016c). The actual performance to underlie the inquiry basis has to be involved into

particular enhancement in regulating the customization and personalization in the sense that can offer comprehensive understanding on the impact of massive data. Since the self-inquiry based learning needs the personalised mode of behaviour performance, the worldwide arrangement of learning process should be engaged into the ability with the customized and personalized services through exploring the potential data determined referring to the entire initiative to support the learning approach. Moreover, the one which can be enhanced in managing the materials should be prepared in such extents in order to support the potential data in the way to enlarge the behaviour performance in collaborating the development process of the structure of learning course which can be applied in getting recognised of the learning quality. As a result of understanding the way of learning with more precision, the particular approach should be engaged into the system which is necessary to consider in particular to supplying the material resources fitting to the demand. It could be identified through connecting the activities fitted to the relevant needs and interest in the way to determine getting access among the wide ranges of webpage (Hoi et al., 2012). In this view, the necessary point to enlarge the pivotal essence entirely to generate learning activities could be achieved in enabling them to make their particular activities through maximizing the big data emerging technology for online learning resources. Referring to an entire attempt conducted to undertake an innovative environment, the needs of personal learning appropriately could be resulted through recognising the basis of big data emerging technology analytic process in order to supplement the support basis for teaching and learning process.

In line with the attempts to understand the initiative to provide the topic content, it is necessary to adopt the system which big data analytic offers through making the pattern resulted from transmitting the massive data. Adopting their activities to the system related to the demand on internet, the initiative to raise the platform in attracting increasingly to the attention basis through big data emerging technology has to be considered in particular essence to engage in the design of operational system. This is to achieve the basis of effective learning integrated into the approach with an essential competence on technology usage basis. In particular, adopting the learning style with the serious effort in the way to enhance the variety of innovative learning interactions could be enhanced to make the model of the models of big data analytic process in enhancing the integration stage to transmit the attempts to get access for online resources (Lyon, 2014). It is adopted specifically into the learning process with the capacity basis through electronic devices converted in the way to the shift paradigm from the traditional basis to the virtual approach. Through high-impact educational experiences for instance (Maselena et al., 2017b), big data emerging technology with an entire enhancement referring to the online resources with its data analytics has a pivotal role in generating the massive data generated into the pattern related to the need and demand for teaching and learning. In order

to improve the students' learning process together with achievement, the attempt to gain expanding pedagogy and technology skill in proposing the innovative learning design should configure the initiative with the extent to the empowerment through big data analytic process approach to give insights in integrating online learning. In the way to address the learning behaviour, the reference model of big data emerging technology is supposed to contribute online resources initiative.

### **Maximizing Support for Learning Initiative Through Online Resources in Big Data**

Through enhancing the wide range of massive data achieved from the communication and interaction record, transmitting the environmental basis referring to the innovative learning performance should provide the learning sources with its distinctive pattern specifically in resulting the convenient and innovative basis. With this regard, the support determined in this initiative through the big data analytic process has to be engaged into the environment of managing the advancement of technology involvement in addressing the learning enhancement. The contribution here refers to support in accessing the potential value through advancing the way more convenient and active to contribute in supporting the learning performance. The pattern with innovative basis in assessing the learning resources refers to engage in the usability of material resources engaged with adopting the way in absorbing the massive data amounts. In learning through the approach in adopting intervention, customization and personalization, attempts to adopt data sources including interaction and communication records like surveys, newspaper, social network sites (SNS), and other sources, has to be involved in determining widely with interactive learning environment transmitted into the innovative style essence engaged to cover the assortment and volume into the practical basis (Kitchin, 2014). In terms of supporting online resources in the way to configure the self-regulated inquiry, attempts to commit the learning style would be achieved with an entire element to maximize big data approach more flexible and to maximize the way in operating time and place. The resources of learning material assessed in the way to strengthen the learning environment basis could be supported through the big data emerging technology initiative in empowering the guide way in gaining multitude resources in assessing material resources. In particular, exploring online resources has an insight to contribute the significant enhancement in the learning process to determine an attempt to make sure in enabling them to get worldwide of benefits on the technology basis.

In addition, big data analytic process engaged in enabling the students to have chance to produce the platform for the massive data has a worldwide of perfecting the use of whole load of information modified to check creating online sites in

connecting technology that acts as a medium in the internet basis. Their interest into the particular subject about the certain topic gathered through the form of collecting such different structured and unstructured data needs to expand worldwide of accommodating information through developing the pedagogical skills in the digital era (Huda et al., 2017i). Social media platform basis in offering the sites to let the users to have such different experiences through information pattern refers to provide massive data elucidation through searching for materials collection provided. In the attempts to store the uploaded materials to have the skills particularly in using the digital devices, there should be widely enhanced to use wide range of programmes in enabling the internet basis to postings and uploads of Web page or websites. In this regard, the availability of good internet connection has also the impact to the quality in accessing the learning resources as provided by big data emerging technology in referring the completion of setting the skills to allow the technology connection accessed among the users. It is required into the highly advanced modern technology through online reserved to entering the particular web address. As a result of addressing the process in the way which is formed into the communication and interaction basis, this initiative would automatically be saved in the big data in the basis of getting information data massively for the specific web address. Big data emerging technology should be determined along with strengthening the subsequent extent of enhancing the convenient way of learning style through introducing, preparing and managing the learning arrangements in the online basis. Moreover, this initiative to support the learning approach to improve the necessary implementation basis would progressively lead to the way of big data emerging technology to supply the online resources for learning (Anshari et al., 2016). As a result, considering more upgrade to cover such usability on the technology platform should be prepared in providing the better facilitation successfully through implementing the way of learning process with the support of technological tool. In particular, the process of learning activities with borderless space could be achieved through utilizing extraction of massive data amounts created every second across the social media platform. In this regard, the innovative based learning model referring to the network considered into the extent of learning activities should be determined into subsequently regulating the technological empowerment in strengthening pervasive knowledge based learning enhancement by providing the entire extent of beneficial values (Anshari et al., 2015). With regard to enhancing the learning basis in the perspective of anywhere and anytime context, big data-based technological tool to support the learning sources could point out the academic skills with a sufficient support on the availability of influencing the effectiveness of learning. In particular, the collaboration basis in the way to incorporate the big data analytic approach attempts to empower the orientation in enhancing the practical strength in the way of assessing the practice by widening the data complexities. It could enhance the

learning process to make easily through emphasizing the voluntary data in gaining the learning sources complemented particularly into making a whole context to underlie online learning sources indicators.

In line with gaining the point of providing such platform together with the opportunities to maximize the potential value of massive data, big data approach in the attempts to integrate the learning in the way that can consolidate the potential value transmitted into the pattern of the interactive practice assigned with configuring the self-regulated inquiry. Innovatively to transform the potential data followed into the services, the initiative in offering the delivery of knowledge customized and personalized in recognizing the materials prepared in the system needs to explore the ability to manage such extents of supplying resources for the learning process (Anshari, Alas & Guan, 2015). With an entire initiative regarded as more precision in the way to take into account the online learning, it can be supplied throughout the resources link which can be easily accessed among the peers in order to facilitate them in the subject material relevant to needs and demand (Maselena et al., 2017b). As a result, the significance of understanding the learning quality in the way to develop the learning structure should be developed referring to the learning course in determining to generate records of their activities. This structure should be engaged entirely into enabling them to enhance to get in understanding the wide range of webpage in underlying the performance on the learning activities (Nacheva-Skopalik & Green, 2016). Through posting the activities into the details frequently, the entire effort in undertaking to understand the pivotal essence to the initiative to prepare the good value of topic content related to the needs, the worldwide basis of learning enhancement could be achieved entirely referring to the pattern resulted from adopting their record coming from the activities generated to the transmission system. The value can appropriately be achieved to give the attractive potency into technology learning environment as the initiative to raise the platform of big data integration stage. In attracting increasingly with the effective learning, integrating big data approach with pointing out the essential competence could be taken seriously in the operational system design of the models. In particular, technology competency regulated into the model of learning style in enhancing the usage demand on internet basis would need to adopt specifically in the capacity basis towards distinctive pattern of learning environment. The basis of the learning performance specifically with providing the learning sources could contribute to support the way which is more active and convenient to enhance adopting the way to assess the sources of learning material (Omar, Kalulu & Alijani, 2011). In terms of the learning performance adopted from customization, personalization and intervention within big data analytic process, the process itself could be enhanced with more convenient and innovative basis in the sense which can be transformed

to absorb the massive amounts of data engaged with the attempts in covering the assortment and volume.

## **CONCLUSION**

Exploring the basis of theoretical foundations of big data emerging technology in the way to elaborate the design of interactive essence to generate the adaptive online learning, this chapter provided construction in facilitating innovative learning to transmit the environmental basis to support in applying this model to the design of big data analytic process. There are several stages to achieve analytic process for big data emerging technologies including innovative design for adaptive online learning technology in big data approach, strengthening technology learning environment in big data analytic process, interactive environment for adaptive online learning technology in big data, maximizing support for learning initiative through online resources in big data. Giving insights in facilitating design with a wide range of various educational experiences, the necessary point to access online resources using their mobile devices could be taken through exploring the big data approach in enabling students to get engaged with innovative and high-impact educational experiences. With the high impact in covering a wide variety of big data emerging technology, promising content that can be enhanced in the digital devices to extend the direction on online learning with big data integration. In promising the further research, the context of the implication in proposing innovative learning design, the internet behaviour essence has to be widely engaged into the virtual learning model in online learning. Through big data approach together with expanding their pedagogical repertoires, it indicates that shifting paradigm on the way to learn among the learners to support an initiative to enable them in sustaining their behaviour on learning is supposed to contribute in providing wide range of multi-channels of learning materials. Among the learning and teaching sectors as well as the professions, they are arranged to work together with exchanging the particular ideas through providing examples to achieve best practice focusing on learning design which can be recommended among the leading education researchers and professionals, policy makers and educators. This chapter is supposed to contribute in providing the online resources for interactive learning referring to the big data emerging technology through the reference model to enhance the learning environment and outcomes assigned into performance and achievement.

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