# An E-learning Framework:
# Enhancing the Student Learning Style

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## Abstract

The primary objective of this study is to find out the readiness of the Department of Education and schools in the Philippines to adopt new technology for learning materials as part of the basic education curriculum. This study provides e-learning framework that determines the learning styles of students to improve their performances, as well as the teachers. This also allows the teachers to identify the preferred learning styles of students. In view of this, teachers may have deeper understanding on how to adjust their teaching strategies by preparing appropriate learning materials. Likewise, making students aware of their learning styles; the strengths and weaknesses enables them to improve their learning abilities and overcome their weaknesses. Giving students learning materials and exercises that fit their desired methods makes learning less demanding for them.

*Keywords: e-learning Framework, Network Infrastructure, Cloud Computing, and Learning Style, student performance*

## 1. Introduction

Nowadays, the effective use of computer technology has been empowered as an important skill for future education. Nearby regions, governments, and schools and guardian's assemblies used billions of cash to purchase machine equipment segments and programming provisions for schools. Implementation of this technology needs specialized backing to PC ability and reconciliation, in the same way as whatever viable activity, is constrained without proper support.

Cloud computing innovation has been considered a paramount part in the realm of Information Technology. Meanwhile, the end-clients on the Internet can access numerous servers of trade data around themselves [1]. Cloud computing is one of the new innovation slants that has noteworthy effect on learning environment and teaching. Individuals are accountable for their business spot challenge, as well as the reproduction of data innovation operations to help and accomplish their corporate targets in the light of diverse engineering patterns. This drives them to depend on outsider administrations particularly in building their in-house capacities and fulfilling the requirements of their end-clients, clients and vital accomplices. Climbing business requests are compelling reliable Information Technology (IT) individuals to think about better approaches on how to reallocate their constrained inner assets to back-up corporate necessities.

At present, cloud computing platforms such as, Google and Microsoft, are giving free administrations to learners and staff of educational institutions that incorporate timetables, record stockpiling, email, contact records, creation and offering archives and the capability to make sites [2]. A study in different organizations was conducted from distinctive businesses that have fabricated custom usage of cloud and dissected how cloud computing influenced their operations in three key regions: Integration, and Time-to-Value.

## 2. Methodology

### 2.1 Conceptual Framework

E-learning integration can be achieved in three phases such as, before integration, during integration and after integration. Before integration, a number of activities like Analyze integration activities, Analyze user characteristics, Analyze learning objects, Analyze the learning environment, Identify learning methods, Compare alternatives, Prepare infrastructural budget, and Identify funding sources are carried out.

The Interaction, in which the learner is challenged and supported to solve domain-relevant problems, the learner thereby encounters domain knowledge in the context of authentic problems and is motivated to exercise the said knowledge [3].

During the integration phase, a number of activities are carried out. These include the implementation of Audio learning, Video learning, Discussion forums, instant messaging, Content management, Bulletin boards, and

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Chart rooms. The stakeholders such as, the university, the lecturers, the students, and the content developer are responsible for implementing these.
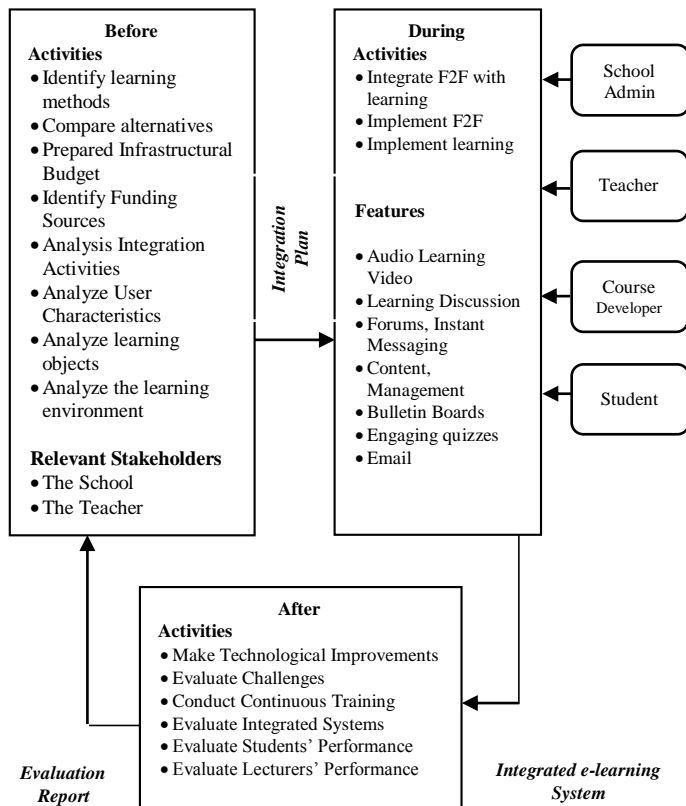


Fig.1 Theoretical Framework of Cloud e-Learning System

After integration, the following activities should be carried out to ensure that integrated systems work properly according to the plan in phase 1. These activities include evaluating integrated systems, evaluating the performance of students, evaluation of the performance of lecturers, technological improvements, evaluation of challenges, and continuous user training. The relevant stakeholders for implementing these activities are the university, the lecturers, the students, the government, and the private sector.

Each of the above phases has a key deliverable; before integration activities yield into an integration plan, while during integration deals with the development of integrated teaching methods, and after integration refers to integration evaluation report [4].

2.2 Conceptual Framework

In the conventional e- learning model, instructors allocate exercises, behavior customary addresses, or evaluate the performances of learners. The students proceed to online self-ruling learning act and intuitive learning sessions.
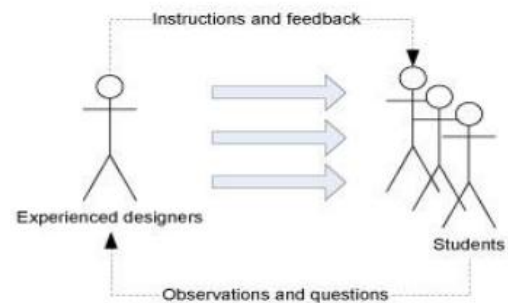


Fig.2 Conceptual Framework

The proponent used Face-to-face driver which teachers deliver most of the curriculum for basic education. Teachers lead the class in a lecture following an established protocol taking precedence and technology being secondary thought. However, they also produce online resources to supplement or revise course material which students can study at home, in the classroom or in a technology lab.

E-learning here in the Philippines is a combination of face-to-face and online. To improve the learning style in the Philippines, the proponent adopts the hybrid learning course format that provides an opportunity to keep and develop the strengths of both face-to face and online formats. Having some required in-person sessions would retain the important cohort or sense of connection for students while decreasing the amount of scheduled class time and decreasing the amount of commuting time.

## 3. Result and Discussion

In summary, all schools are expected to implement e-learning. However, successful implementation of e-learning relies on the level of readiness of ICT infrastructure and users. To adopt e-learning, schools should attain the expected level of physical infrastructure development and e-learning users should also acquire necessary technical competency combined with positive attitudes and perceptions toward e-learning. Therefore, to implement and realize the benefits of e-learning in schools, this study examined the readiness of schools to implement e-learning by exploring the level of physical infrastructure development, technical competency of users, as well as their perceptions and attitudes toward e-learning.

The findings of the study demonstrated that most teachers can confidently operate computers with minimal time consumption, limited frustration and less confusion. From

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the readiness of teachers, students and school administrators, this is an adequate level of ready-to-implement e-learning. However, it needs some improvements. Therefore, teachers must have necessary technical skills required for e-learning adoption for the success of its implementation.

Table 1: Assessment of the Principal Respondents for E-learning Challenges to the Schools

| Parameters | Weighted Mean | Remark | Rank |
|---|---|---|---|
| Cost of skilled IT Resource | 3.43 | Challenging | 4.5 |
| Cost of system Acquisition | 3.43 | Challenging | 4.5 |
| Cost of Maintaining a computer | 3.71 | Very Challenging | 2.0 |
| Power and Cost of Powering Generator | 3.86 | Very Challenging | 1.0 |
| Fear of Computer Crashing | 3.00 | Challenging | 7.5 |
| Fear of Information Theft / Hacking | 3.29 | Challenging | 6.0 |
| Network Connectivity | 3.57 | Very Challenging | 3.0 |
| Lack of IT Knowledge | 3.00 | Challenging | 7.5 |
| Staff Resistance to Change | 2.71 | Challenging | 9.0 |
| **Over-all Mean** | **3.33** | **Challenging** | |

Table 1 presents the assessment of the respondents on e-learning implementation challenges. The fourth criterion "power and cost of powering a generator" was ranked 1 with a weighted mean of 3.86.

On the other hand, "cost of maintaining a computer" was ranked 2 with a weighted mean of 3.71 while "network connectivity" was ranked 3 with a weighted mean of 3.57. "Cost of skilled IT resource" and "Cost of system acquisition" were likewise ranked 4.5 with 3.43 as weighted mean.

Moreover, "fear of information theft/hacking" was ranked 6 with a weighted mean of 3.29.

Lastly, "fear of computer crashing" and "lack of IT knowledge" were rated 7.5 with similar weighted mean of

3.0 and "staff resistance to change" was ranked 9 with a weighted mean of 2.71.

Findings show that there is a high level of challenging factors towards the adoption of e-learning in any schools. Administrations are mostly challenged with the available technological infrastructure.

Table 2: Assessment of the Principal Respondents in terms of Willingness

| Criteria | Weighted Mean | Remark | Rank |
|---|---|---|---|
| Access to digital teaching and learning resources, including digital textbooks | 4.43 | Agree | 6.5 |
| Shift from traditional print and paper-based resources to affordable, current online resources | 4.57 | Strongly Agree | 4.5 |
| Increase virtual learning opportunities so every student no matter where they live can reach his or her potential. | 4.57 | Strongly Agree | 4.5 |
| Put more technology into the hands of students and teachers to increase individualized learning options. | 4.71 | Strongly Agree | 3.0 |
| Develop a next generation learning assessment system which includes formative, benchmark and summative assessments based on the new standards. | 4.86 | Strongly Agree | 2.0 |
| Increase the use of technology for providing professional development opportunities for teachers. | 5.00 | Strongly Agree | 1.0 |
| Prepare staff / students for online assessment delivery. | 4.43 | Agree | 6.5 |
| Implement e-learning programs to have means of getting certification on the instructional design skills for e-learning. | 4.29 | Agree | 8.0 |
| **Over-all Mean** | **4.61** | **Strongly Agree** | |

Table 2 presents the assessment of the principal respondents in term of willingness. The data reveal that "increase the use of technology for providing professional development opportunities for teachers" was ranked 1 and has a weighted mean of 5.00 and described as strongly

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agree. The teachers and students were made to inspire the user of e-learning infrastructures to advance teaching and learning in the university [9].

The data reveal that "develop a next generation learning assessment system which includes formative, benchmark and summative assessments based on the new standards" was ranked 2 and has a weighted mean of 4.86 and described as strongly agree. The declaration underlines how the new ICT innovations make a key commitment to instructional and instructive innovativeness by bringing huge progressions into the educating e-learning framework as far as both the instructive offering and its utilize and circulation all around the nation [5].

The data reveal that "put more technology into the hands of students and teachers to increase individualized learning options" was ranked 3 and has a weighted mean of 4.71 and the one of the methodologies for upgrading school competitiveness through e-learning is improving help supportive network for teachers and students [6].

Both "shift from traditional print and paper-based resources to affordable, current online resources" and "increase virtual learning opportunities so every student no matter where they live can reach his or her potential" were ranked 4.5 and have weighted mean of 4.57 and described as strongly agree and the teachers battle to figure out what impacts a person to take online school courses, and how they best take in nature [7].

"Access to digital teaching and learning resources, including digital textbooks" and "prepare staff / students for online assessment delivery" were ranked 6.5 and have weighted mean of 4.43. It is also supported by the article from eCampus University that e-Learning system introduced to provide teachers and students as effective methodologies and techniques that allow each to perform his own role in terms of effectiveness and high scientific quality while saving time and money.

The data reveal that "Implement e-learning programs to have means of getting certification on the instructional design skills for e-learning" was ranked 8.0 and has a weighted mean of 4.29. The e-learning framework might be scaled both evenly and vertically and the instructive association is charged as per the amount of utilized servers that relies on upon the amount of learners [8].

Indeed, determining the learning styles of the student for them to improve their performance as well as the teacher. The teacher can benefit by getting data about how their students are used to learn, which gives them a deeper comprehension and may help when clarifying or preparing the learning material.

Likewise, making student aware of their learning styles and demonstrating to them their individual strengths and weaknesses can help student to comprehend why learning is difficult for them to understand and also serve as the basis for the development of their weaknesses. Besides, student can be upheld by coordinating the teaching style with their learning style.

Table 3: Assessment of the Student Respondents in Terms of Functionality

| Criteria | Weighted Mean | Remark | Rank |
|---|---|---|---|
| Teachers are able to track and evaluate the progress of the student. | 4.06 | Agree | 2.5 |
| Teachers expect to receive feedback from the students. | 4.15 | Agree | 1.0 |
| The e-learning subjects are updated and current in both content and technical aspects. | 3.98 | Agree | 4.0 |
| A variety of instructional or learning activities are used to promote interactivity that includes online discussions, online conferencing, collaborative assignments and participation. | 3.88 | Agree | 5.0 |
| E-learning materials are in multiple formats to support variety of learning preferences & experiences | 4.06 | Agree | 2.5 |
| **Over-all Mean** | **4.03** | **Agree** | |

Table 3 presents the assessment of the student respondents in term of functionality. The data reveal that data reveal that "teachers expect to receive feedback from the students" was ranked 1 and has a weighted mean of 4.15. The flexibility of teacher movement was often associated with the opportunity for more effective monitoring of student activity and more effective openings for feedback [3].

The data reveal that "teachers are able to track and evaluate the progress of the student" was ranked 2.5 and has a weighted mean of 4.06. The e-Learning infrastructure, integrated into the global information system, will exploit all information useful for conducting educational activities and managing students, whether it involves constantly monitoring the students' profile and progress or governing the various activities typically present in universities.

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The data reveal that "e-learning materials are in multiple formats to support variety of learning preferences and experiences (i.e., video, text, slideshows, simulations, and others)" was ranked 2.5 and has a weighted mean of 4.06. It creates the possibility of a wide variety of learning practices. One of the central activities which were significantly enriched by the increasingly ubiquitous availability of technologies is the exposition which is animated by the opportunity to invoke rich shared images, video and plans [3].

The data reveal that "the e-learning subjects are updated and current in both content and technical aspects" was ranked 4 and has a weighted mean of 3.98. The thematic analysis considers learning practices based on teachers', senior managers' and students' accounts of the impact of ICT on learning. Teacher accounts and opinions serve as primary data. These have been carefully considered and linked to the teacher lesson logs, as well as to accounts of how the infrastructure of ICT in the school has supported the use of technology, how staff development has supported teachers, and how curriculum.

The data reveal that "a variety of instructional or learning activities are used to promote interactivity that includes online discussions, online conferencing, collaborative assignments and participation" was ranked 5 and has a weighted mean of 3.88. The growing use of a web-based environment for college education is gradually replacing some aspects of the classroom in a University setting, and it is shifting the long accepted paradigm of understanding how students learn and introduces the question of what influences a student's decision to learn in an online environment [7].

Table 4: Assessment of the Teacher Respondents
in Terms of Reliability

| Criteria | Weighted Mean | Remark | Rank |
|---|---|---|---|
| The learning instructions are clear & concise. | 3.83 | Agree | 3.0 |
| The learning contents are relevant to the subject matter and to the "real world" in which the content be applied. | 3.92 | Agree | 1.0 |
| The objectives provide visible sequence of expectations. | 3.81 | Agree | 4.0 |
| The e-learning uses standard equipment that is reliable, widely available, and applicable to a variety of uses. | 3.84 | Agree | 2.0 |
| **Over-all Mean** | **3.85** | **Agree** | |

Table 4 presents the assessment of the teacher respondents in term of reliability. The data reveal that "the e-learning contents are relevant to the subject matter and to the "real world" in which the content be applied" was ranked 1 and has weighted mean of 3.92.

An interaction in which the learner is challenged and supported to solve domain-relevant problems. The learner thereby encounters domain knowledge in the context of authentic problems and is motivated to exercise that knowledge.

The data reveal that the "e-learning uses standard equipment that is reliable, widely available, and applicable to a variety of uses" was ranked 2 and has a weighted mean of 3.84. In order to achieve the goal of knowledge sharing and reusing interactively, lots of available e-learning standards have been adapted to complete the purpose. Normally, learning objects meeting these standards are sharable with other e-learning platforms [3].

The data reveal that the "the e-learning instructions or directions are clear and concise" was ranked 3 and has a weighted mean of 3.83. Universities can offer e-Learning 2.0 tools and services to learners while obtaining clear benefits from releasing the control over some learning content [10].

The data reveal that the "goals and objectives provide a visible sequence of expectations" was ranked 4 and has a weighted mean of 3.81. As per e-learning (2007) stated that one of the administration functions are coherence with the University's objectives, economic sustainability, efficiency of procedures, centrality of users, traceability of users, diversification of targets, control and management of risks.

## 4. Conclusions

When it comes to planning professional development activities in information technology, a similar process to technology planning must be organized in participation with both the district and school levels.

Based on the findings of the study, the following conclusions are drawn:

a. The study established a framework that can help improve e-learning integration in the Philippine Basic Education. The framework can be used to guide school management to achieve the positive effects of e-learning. The study puts emphasis on the infrastructure and ICT skills that must be attained by the management, lecturers and students.

b.  This study examined the readiness of schools in CAMANAVA and other areas towards the implementation of e-learning. Findings show that there is a high level of acceptance towards the adoption of e-learning in any schools. Students are mostly satisfied with the available technological infrastructure. Moreover, results show that a fairly high percentage of students think that e-learning can contribute positively to their learning experience. Actually, students believe that e-learning helped them learn more effectively and thus, they feel ready to take any other e-learning courses. The preferred student-teacher mode of communication was face to face followed by virtual communication.

c.  The study revealed that Basic Education in the Philippines provides support for e-learning implementation. The institutions prioritize the use of technology in traditional classrooms for several reasons. In a nutshell, whether it is an online distance-learning course or technology use in a traditional classroom, e-learning presents a host of new support requirements, and institutions must provide the appropriate resources to address the challenges faced by the school.

d.  The study used agile software development (ASD), a creative process that anticipates the need for flexibility and applies a level of pragmatism into the delivery of the finished product. Agile software development focuses on keeping code simple, testing often, and delivering functional bits of the application upon its availability. The goal of ASD is to build small client-approved parts as the project progresses, and as opposed to delivering one large application at the end of the project.

## 5.  Recommendation

Before the integration of e-learning, the Philippine Basic Education should first acquire and set up adequate ICT infrastructure in order to offer excellent e-learning platforms to students and lecturers.

In addition, the administration of Philippine Basic Education should ensure that the infrastructure is upgraded periodically in order to match the fast changing technology. One way of achieving infrastructural requirements is through exploration of various funding alternatives such as forming partnerships with governments and private sector players. This can help raise funds for ICT infrastructure.

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