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RESEARCH ARTICLE

E-LEARNING FRAMEWORK FOR THE UNIVERSITY OF NORTHERN PHILIPPINES.

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Abstract

The rise of new technologies and the Internet opened-up a whole new possibilities to enhance learning. E-Learning is taking over the academe world like a storm and many Higher Education Institutions (HEIs) are driven to integrate E-Learning and transform their processes and implement organizational change. However, the success of implementing this new paradigm is highly crucial for these institutions. This study presents the proposed E-Learning Framework for the University of Northern Philippines (UNP), a framework that address implementation challenges in order to further the mission statement of the university - to provide quality education. The proposed framework could also be adapted by other State Universities and Colleges (SUCs) in implementing their own E-Learning.

Introduction:-

E-Learning is a new educational paradigm where it provides virtual interaction amongst teachers and students. The advantage of the flexible environment let teachers enhance their knowledge and skills and at the same time, students can learn at their own phase.

The University of Northern Philippines (UNP) adopted a Learning Management System (LMS) for E-Learning to support teaching and learning process within the university. However, success is crucial as the result of implementing e-Learning will clearly be reflected in the return of investment Govindasamy (2011). The following either hinders the integration of instructional technology or lead to difficulty or failure of higher education: a) technology infrastructure; b) faculty effort; c) technology satisfaction; d) graduates competency; e) high cost of technology; f) poor decisions; g) competition; h) absence of a business strategy for the delivery; i) effectiveness; and j) acceptance of the courses (Surry, Ensminger, & Haab, 2005; Elloumi, 2004; Saadé, 2003).

The study aimed to establish a well-adapted E-learning framework that will address the implementation challenges in UNP.

Methodology:-

The study was conducted at the University of Northern Philippines. Random sampling technique was used in gathering data for assessing the e-readiness of both faculty and student. The distribution of respondents was determined using the Slovin's equation in determining sample size. The total participants involved 382 students and 111 faculty members.

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The instrument used for assessing the profile of faculty, students, and administrative and resource support were adapted from Mercado (2008).

The assessment for ICT Infrastructure as well as the ICT Vision, Plans, Policies and Standards and institutional ICT support were based on Mokhtar et al. (2007).

The questionnaire to assess ICT and E-Learning skills of the CCIT Department and Planning Office staff and LMS tools and features usage satisfaction were derived from the study of Teofilo (2009).

The questionnaire on the level of capability maturity of the E-Learning system was patterned from the assessment tool of Marshal et al. (2007).

The results of determining UNP's profile regarding people, infrastructure, and E-Learning were used in the eMM Self Assessment to draw necessary factors that were included in the framework. The result in assessing ICT infrastructure determined other infrastructure factors necessary in the framework for sustainability support. The result in assessing the CCIT Department and Planning Office staff's ICT and E-Learning skills provided factors necessary in organizational restructure and improvement the ICT and E-Learning skills of staff. The evaluation result of the UNP LMS's tools and features will contribute to improving its functionality. The result in assessing the profile of both faculty and students were determined to be the essential factor necessary to provide E-Learning awareness and acceptance. The assessment results of ICT vision, plan, policies and standards, strategic ICT operational plan, administrative and resource support, and institutional ICT support determined factors necessary for proper development and delivery of E-Learning.

Results

Assessment of profile of faculty and student on technology skills, attitudes and technology access.

There is a 'usually' rating of teachers and students along skills, attitude, and technology access. For faculty, 78.38% excel on computer skills, 82.43% have basic internet skills, and 66.2% are literate on online tools and other productivity tools. A 'usually' rating was established on attitude. Also, most teachers have access to computers, the internet, and other tools.

87.3% among students have basic computer skills. However, 76.7% of the have basic internet skills, and 72.21% are literate on software applications. Students' study habits, abilities, motivation, and time management were evaluated in a 'usually' rating. 50.59% of students have access computers, while 62.3% have access to internet connection. Only 49.21% have access to other tools.

Assessment of ICT and E-Learning skills of the CCIT Department and the staff of Planning Office.

An overall mean for the assessed ICT and E-Learning skills in the CCIT Department and Planning Office staff revealed an 'intermediate' level among respondents. This suggests that faculty and personnel are capable of using E-Learning tools in support of their teaching.

Assessment of ICT Infrastructure.

The level of implementation on ICT infrastructure elicited 'low' levels on the ratio of computers and internet-enabled computers to students, wireless coverage and performance of network and internet, and number of classrooms equipped with display screen technologies. Moderate level of implementations were rated on the ratio of computers and internet-enabled computers to lecturers, the internet and bandwidth specification, peripherals, application software, and academic/student information systems. However, learning platforms was rated high.

Assessment of Strategic ICT Operational Plan.

The present status of implementation based on the strategic plan revealed half of the academic programs, support services, general administration on IT and software development are readily implemented.

Assessment of ICT Vision, Plan, Policies, and Standards.

All of the dimensions were given 'low' ratings due to unawareness of the ICT implementation which brought low understanding of the vision and plans with regards to university activities. The only policy set by the UNP was in line with the purchase of equipment, and very few are in place in the level of policy development and implementation.

Assessment of Administrative and Resource support.
A 'satisfactory' level of implementation regarding administrative and resource support were established which was described by a 'high' administrative support level based on commitment, policies and instructions in the extent of institutional readiness but 'moderate' level of resource support regarding financial, human and technical.

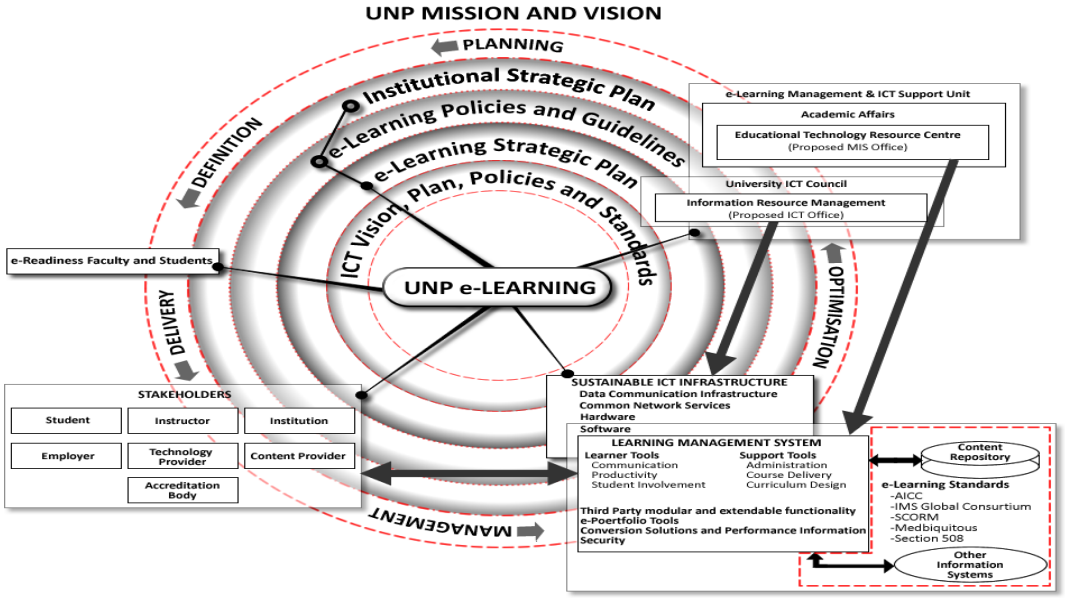
Assessment of Institutional ICT Support.
Almost all dimensions were rated 'low' along ICT skill development and technical support. The only dimension that received a 'moderate' rating was the integration of ICT literacy in the curriculum. This was further explained by reasons but not limited to the idea that ICT skills development must be integrated in the different courses as requirement to further enhance the learning capabilities of both the faculty and student.

Assessment of LMS Tools and Features.
Majority of the respondents had 'intermediate' learning capabilities. Only few rated themselves 'advanced'. The result showed that most are computer literate and are willing to learn. The most common reason of LMS usage was to engage students in online as well as face-to-face contact. Moreover, an 'unsatisfactory' level of usage of the UNP LMS's features and tools was determined. The results further indicated a 'satisfactory' level on user account and assignments. However, the following features were rated 'unsatisfactory': help facility, calendar, announcements, users, wiki, exercises, groups, course description, forum, documents and links, learning path, course management, delete all groups, chat and agenda.

Level of Capability Maturity of E-Learning.
There was a 'partially adequate' level of capability maturity of E-Learning system in UNP. This was further proved by the 'partially adequate' overall level of capability maturity along learning, development, support and evaluation but capability maturity level on organization was 'not adequate'. In addition, the rubrics indicated that the practice outcomes were being achieved. However, more formalization was needed to ensure sustainability such that more systematic consideration of activities had been lacking. This occurred as a result of an aging first generation of E-Learning systems or investments that was not actively re-examined and maintained. The partially adequate and not practiced E-Learning activities were primarily influenced by the results garnered from the e-readiness profile of UNP in terms of people, ICT infrastructure and E-Learning.

E-Learning Framework for UNP
The framework as shown in Figure 1 can be categorized into four dimensions: institutional, management & resource support, technological and assessment. The institutional and management and resource support serve as guiding dimensions. The UNP Mission and Vision and Institutional Strategic Plan are components of the Institutional dimension while the ICT Vision, Plan Policies and Standards, E-Learning Policies and Standards, E-Learning Strategic Plan, Capability Maturity Cycle, and ICT and E-Learning Management Unit belongs to the Management and Resource support for governing ICT and E-Learning within the university.

Figure 1:-UNP E-Learning Framework



The sustainable ICT infrastructure and the UNP LMS are covered by the Technological Dimensions. The assessment dimension covers E-Readiness, identification, responsibility and needs assessment of Stakeholders. The different dimensions may overlap each other (e.g. the E-Learning Strategic Plan and E-Learning Policies and Standards may belong to the institutional and management dimensions due to the components' cross-cutting nature).

The philosophy behind the spherical view of the framework revolves around the concept of dynamism to properly show the Capability Dimension Cycle's chore and use to continuously improve the university's capability to implement E-Learning in a continuous improvement cycle. The flow of importance of each guiding components starts at the core moving out. The concept interactive unity and coherence among each aspects of the framework is integral because these are influencing factors in the development and improvement of E-Learning implementation. The central core of the framework emphasizes the landscape or standpoint of where the university stands in with the implementation of E-Learning. The rounded rectangle denotes the landscape of which UNP wants to achieve its E-Learning endeavors. As seen in the diagram, the dotted/dashed lines signify a cyclic ring of varying diameters which defines the different guiding components of the framework. The boxes denote subcomponents of the different guiding components of framework. The black dots indicate the placement of each subcomponent to their respective owners. Arrows signifies degree of influence between framework subcomponents.

ICT Vision, Plan, Policies, and Standards, Sustainable ICT Infrastructure.
There is an inadequate network infrastructure and number of computer units for faculty as well as student use. The network/internet performance is slow. To address the challenge, there is a need to provide better access and increase wireless coverage in the campus. Service providers with faster internet connections should be tapped. There is also a need to purchase display screen technologies, printers, other peripherals software, and information systems, etc. Again, to effect these solutions, there is a need to have sustainable ICT infrastructure.

ICT infrastructure comprises of three major components: the data communication network; a Network Operations Center (NOC); and the computing resources for the users. The university should integrate the three said components in its ICT infrastructure to support web-supplemented courses, web-dependent courses, mixed mode courses and fully online courses. Also, a university-wide data communication network consisting of the following building blocks must be established: a) a data backbone interlinking all buildings for each college and institution; b) individual Local Area Networks (LAN) for all administrative and academic buildings, c) infrastructure for wireless access of students and staff within the campus; and d) infrastructure provisions for off-campus access for students and staff.

Electronic mail (e-mail) services will provide users the means to exchange digital messages using a store and forward mechanism. Electronic mail systems accept, forward, deliver and store messages on behalf of users, who only need to connect to the e-mail infrastructure for the duration of message submission to, or retrieval from, their designated server.

Access to the Internet is one of the most valuable communication services for institutions of higher learning. It provides access to a wealth of information sources located on computer systems around the world. Like the e-mail service described above, the service relies on correctly functioning low-level network support services. Provision of Internet access is beneficial to all university students and staff for facilitating research and learning.

Web services on the other hand will exist to provide facilities for storage of information formatted as web pages, and make such information accessible to the University community and the general public. The service is subdivided into two subservices, namely Intranet services and the University web page. Intranet services will be used for on-line publication of parts of the University databases within information systems. Further, the service will be used to access course manuals and other study and research documentation hosted within the university E-Learning platform (UNP LMS). The University web page on the other hand will publish information whose access will not be restricted, and therefore will be available to all users on the Internet. Besides, it is the University's policy to provide web services for the purpose of disseminating information within the University and to the rest of the Internet community. All of the provisions of network services mentioned above should be included in the University ICT Policy. The university should invest in infrastructure hardware for the campus network and the servers running the E-Learning, administrative and library systems.

In this study, it was found out that there is inadequate knowledge of the faculty and students on how to resolve common errors while surfing the net. There is a need to provide more training programs and mentors to address the low level of implementation of ICT skill development,

On equipment, fixtures, and accessories on hardware and software, there is a need to acquire them, and there is a need to integrate such strategy in the ICT vision, plan, policies, and standards.

The ICT vision and strategy should focus on people and not just on technology. It is important to develop both the ICT vision and strategy with people in mind and with their involvement. Educators, psychologists, project managers, engineers (hardware, telecommunications, and software) and graphic designers: these roles will help govern the sustainability of the University ICT infrastructure.

Concerning the implementation of ICT, the vision is not clear and not generally known by the university constituents. The scope of the ICT plan is limited to the acquisition of basic hardware and software. There is limited funding for the modernization program. There is no regular review of the ICT policy. To address this, The ICT vision of the community should be integrated into the development agenda of the new dispensation. The ICT plan should be made more encompassing to include the capability building of faculty and staff. More funds should be allocated for the ICT plan of the university. To succeed in this area, there is a need to integrate these solutions in the UNP Vision and Mission and Institutional Strategic Plan of the University. To address the 'low' level of implementation on who drives the ICT vision and who participates in the development of ICT plan, the university should establish policy and operational structures to oversee the management of the ICT in the entire university. At the policy level, the creation of an organizational unit-University ICT Committee (UICTC) should be set up by administration, while at the operational level, an Information Resource Management (IRM) Unit should be established. The UICTC will have internal representation from academic faculties, students and administration of the university. The IRM unit shall be the secretariat to this committee. The Committee's responsibilities are to: a) monitor and control the progress of all activities arising from the implementation of the ICT Policy; b) allocate resources according to the agreed master plan; c) budget for the cost of management, operations, maintenance, and expansion through the university budget; d) recommend proposals for cost-recovery and cost-sharing; and e) determine /approve ICT Policy adjustments arising from technology trends or new visions and strategies

An essential component of the framework is to create these organizational units for overseeing the increasingly complex ICT infrastructure. This unit would provide services ensuring the appropriate design, procurement, ongoing management and maintenance of the central ICT infrastructure; a second-level help desk (serving technical support staff within other units); as well as providing coordination of the various decentralized aspects of ICT infrastructure. The establishment of these units can address the other critical issues that have low levels in implementation in the ICT vision, plan, policies and standards and institutional ICT Support.

To further address the issue on the low level of implementation of technical support, the university should adopt an ICT management model with service deployment at both the centralized and decentralized levels to offer complimentary support services across the units.

UNP LMS.

The majority of the faculty respondents have 'intermediate' learning capabilities. It is suggested that UNP LMS is to be established as a framework component since most of the students engage themselves in online as well as face-to-face contact. To address the 'unsatisfactory' usage of the UNP LMS tools and features, a list of suitable tools and features as shown in Table 1 will be incorporated for the improvement of the UNP LMS.

Table 1:-Learning Management System Tools and Features

Learner tools	
Communication Tools	▪ Discussion forums ▪ File exchange ▪ Internal email ▪ Online journal/notes ▪ Real-time chat ▪ Video services ▪ Whiteboard

Productivity Tools	▪ Bookmarks ▪ Orientation/ Help ▪ Plan/Progress review ▪ Searching within course ▪ Work offline/ synchronize
Student Involvement Tools	▪ Group work ▪ Self-assessment ▪ Student community-building ▪ Student portfolios
Support Tools	
Administration Tools	▪ Authentication ▪ Course authorization ▪ Hosted services ▪ Registration Integration
Course Delivery Tools	▪ Automated testing and scoring ▪ Course management ▪ Instructor helpdesk ▪ Online grading tools ▪ Student tracking
Curriculum Design Tools	▪ Course templates ▪ Curriculum management ▪ Customized look and feel ▪ Instructional design tools ▪ Designer file and content management
Other Tools	
Third-party modular and extendable functionality	▪ Third-party content ▪ Assessment tools ▪ Content management tools
ePortfolio tools	
Conversion solutions and performance information	▪ Conversion/Migration solutions
Security	▪ Access and security strategies ▪ Security provider ▪ Database security relationship ▪ External security standards ▪ Future compliance ▪ Security integration scenarios ▪ Accessibility compliance

The various standards and guidelines exist for E-Learning are of great importance in the context of a learning management or learning content management system implementation. The UNP LMS must be compliant to the key E-Learning standards and Guidelines (Airline Industry CBT Committee (AICC), IMS Global Learning Consortium, Sharable Content Object Reference Model (SCORM), Medbiquitous & Section 508) to help ensure the following: a) any course created for use in the UNP LMS should function properly in other systems; b) learning contents can be tagged so that it can easily be discovered and reused, whether in a single, multiple, or disparate systems; c) ability to import, launch, and track a lesson or course that has been developed according to the SCORM model; d) recognize and manipulate shareable content objects, or SCOs; e) exchange educational content and track learner activities and profiles as part of healthcare education and competence assessment; and f) address the accessibility of electronic and information technologies, including the Web, by people with disabilities

Stakeholders.

Wagner et al. (2008) stressed out that successful E-Learning implementation is dependent on the extent to which the needs and concerns of the stakeholder groups are addressed. Students, Instructors, Educational Institutions, Content Providers, Technology Providers, Accreditation Bodies, and Employers are the seven stakeholders identified and compiled by Wagner, et al. (2008) that will be incorporated into the framework as part of assessing needs and

addressing concerns purposes. Also, the students should be engaged in stakeholder analysis for the reason that planning education should teach techniques for stakeholder engagement and the analysis of input from stakeholders as part of the preparation of future professional planners

E-Learning implementation in UNP should endeavor to satisfy the needs and concerns of all its stakeholder groups as much as possible. The university could utilize the stakeholders' responsibility matrix as a starting point when undertaking a new E-Learning initiative. The stakeholders involved and their associated responsibilities could be adapted to the nature of the particular initiative at hand. As such, the matrix will help UNP to identify the appropriate stakeholders' and develop a set of expectations for each.

Institutional Strategic Plan, E-Learning Strategic Plan, E-Learning Policies and Guidelines, and MIS.
The institutional strategic plan is situated in the uppermost tier in a planning hierarchy, and it is responsible for shaping the plans of academic, administrative and operational units of the institution. Based on this concept, the institutional strategic plan of the framework is situated above all the components that govern both E-Learning and ICT. The strategic plan is regularly monitored, evaluated and revised in line with experience and developing requirements. Institutions should communicate strategies based on the recommendations and guidance from across the institution and beyond.

The UNP strategic plan should encompass a vision for the use and development of E-Learning within the university and provide a timescale for the achievement of strategic goals, and should address the provision of the human, technical and financial resources necessary for implementation. The UNP strategic plan should also identify the roles that E-Learning will play in the overall development of the institution and set the context for the production of the plans of academic departments, administrative, and operational divisions.

The institutional plan should also outline options for the use of E-Learning in teaching that may define a spectrum of "blends" of E-Learning and more established pedagogic mechanisms. The institutional strategic plan should ensure academic departments are consistent with each other.

The E-Learning strategic planning process should involve studying the nature and the decision-making processes within UNP. Satisfactory results on ICT support, administrative and resource support can be achieved by the following: 1) supporting projects that enable staff to experiment and evaluate the use of E-Learning; 2) regular evaluation of E-Learning projects through research; 3) enabling staff to meet and share their experience and good practice; 4) support staff development; 5) examine and learn from effective practice in other institutions; 6) provide effective induction programs for students enabling them to develop knowledge and skills in the use of E-Learning; 7) effectively deploy resources to support development of E-Learning; 7) encourage diversity of approach, provided it can be supported within the available resources; and 8) encourage the development of integrated systems and support.

Drliket et al. (2011) characterized E-Learning implementation approaches as either bottom-up or top-down. Aside from the chosen strategy, it is known that a successful E-Learning strategy relies on people, tools, training, processes, and support. Understanding the effect of these elements will ensure selection of the best-suited strategy for current needs and will be flexible enough to support the changing needs of the university over time.

Looking back at the partially-adequate E-Learning practices and processes in UNP, the bottom-up approach was clearly the implementation utilized. Despite the best intentions and enormous energy without the collaborative efforts of initiators and the administration, an individual cannot shift E-Learning from the margins to the mainstream across a hierarchical structure of the university. Therefore, it is evident that the management support and strategic planning are essential to take E-Learning from periphery to mainstream level.

The top-down approach is much in favor of addressing the major process areas used in capability maturity in implementing E-Learning due to the initialization on the implementation of E-Learning solutions is in line with long-term vision of the university development. Table 2 discusses the top-down approach to addressing the partially-adequate and not practiced E-Learning activities in UNP.

Table 2:-Top-down approach strategy for better E-Learning implementation in UNP

People	▪ Create the team (E-Learning Management & ICT Support Unit) of specialists from the

	university departments necessary for the success of implementation right from the beginning. ▪ Use the knowledge of university environment and know the people who are already using the E-Learning in an amateur way. ▪ Clearly specify the responsibilities of particular members of E-Learning management team. ▪ Address making the change understandable to teachers, administrators and students. The best ideas can fail if they are not properly understood by the stakeholders. ▪ UNP Administration should attract all potential partners and invite them to share their vision and to participate in its implementation.
Tools	▪ Assess options and determine the best tool for the university's needs, users' needs. ▪ Selection of the LMS for E-Learning implementation. The size and forecasted growth of the organization, and how it uses E-Learning for training and development, will dictate the type of LMS that UNP needs to consider. ▪ Choose among commercial packages on the market and open-source solutions. ▪ Regard many parameters in the LMS selection process, mainly integration into other information systems of the institution, scalability, possibilities of technical support and update, security and so on.
Training	▪ Trainings and certifications take care of target groups needs. ▪ Preparation of teachers for managing teaching by E-Courses in blended and distance learning forms. ▪ Develop students' competitiveness and the ability of the course designer and the instructor to exploit technology efficiently, effectively, and at the right moment ▪ Provide training in small, bite-sized learning chunks, minimizing the time and resources required to support these types of training initiatives
Processes	▪ Identification of the whole process in advance and defining exact rules and procedures
Support	▪ Full time technical support. ▪ Full time instructional designers. ▪ Course development in-house or course development on demand by the external supplier. ▪ Just-In-Time support is more effective than general training sessions. Just-In-Time support involves providing training, help or advice to a course team when they need it. ▪ One-to-one mentorship as part of a staff development program. ▪ A discussion platform for staff to showcase their uses of the system and to ask for help and share tips was reported as helpful by all authors. ▪ Use the E-Learning system itself to run courses for staff. ▪ Clear payment model.

To further address the adequate practices of developing, deploying, and support practices of E-Learning, the following policies will help instructors as well as students for managing E-Learning courses: a) E-Learning policies in the course syllabus, student privacy policies, b) E-mail policies, c) discussion policies, d) software standards policies, e) assignment policies, f) getting technical help policies, g) student code of conduct policies and h) intellectual property rights policies. Also, King, et.al. (as cited in Teofilo, 2009) provided seven areas that are strategic management decision zones used in developing E-Learning policy: academic, governance/administrative/fiscal, faculty, legal, student support services, technical, and cultural. The E-Learning management team could focus on the said management zones for policy and guidelines development. Issues related to staff release for involvement in e-course development, the workload for teaching e-courses, evaluation of the effectiveness of E-courses, and funding should also be considered.

Concerning administrative and resource support, the university is not financially ready to venture into E-Learning. The institution has low priority on experienced human resources, or a department that organizes training related to online learning. To address these challenges, the university should tap institutions for technical and financial assistance. To further improve the administrative and resource support, the E-Learning function should be managed by a central E-Learning unit (proposed MIS Office) that will be responsible for the university wide direction, management and implementation of the E-Learning function and the maintenance of the UNP LMS. This unit is also responsible for establishing the Educational Technology Resource Centre which consists of different categories of people with ICT skills, teaching experience, technical skills, operational skills, and good communication skills.

Specifically this unit will be mandated with: 1) coordinating of all E-Learning activities; 2) vetting proposals on E-Learning; 3) monitoring and evaluating E-Learning implementation; 4) promoting E-Learning through awareness seminars and workshops; 5) and ensuring implementation of agreed policies in the faculty, and guiding the development and implementation of faculty-specific E-Learning activities. Based on the possible organization structure which involves E-Learning staff by Teofilo (2009), the content developer and subject matter expert, instructional designer, interface designer, graphic artist and multimedia developer and quality assurance altogether with systems administrator, server/database programmer, technical support specialist, administrative services and registration services roles may be adequate in being part of the E-Learning management team responsible for the university-wide direction, management, and implementation of the E-Learning function.

Capability Dimension Cycle.
To provide continuous improvement on E-Learning, the capability dimensions, planning, definition, management, and optimization, discussed in the eMM are used to improve the university's capability in E-Learning implementation towards achieving the mission and vision of the university in a continuous improvement manner (Teofilo, 2009). This will ensure the quality of improvement of the existing E-Learning System and will improve the maturity level of UNP E-Learning activities.

E-Readiness.
Readiness factors are all internal and primarily relate to the readiness of people such as: the key stakeholders who will make the budget available for E-Learning; the administration, different institutions and colleges of the university; the people responsible for the vision and strategic directions of an organization- Academic Affairs; the people in charged with managing the E-Learning initiative- MIS Office; and the people that will apply and maybe contribute to the E-Learning- students, faculty, technology providers, content providers, accreditation bodies, employers, etc.

UNP Mission and Vision.
The university's mission and vision are the guiding statement or a roadmap that drives all the E-Learning Framework components. The integrity of the mission and vision of the institution must provide sustainability and productivity programs that will intensify the Modernization Act of the Commission on Higher Education. The optimum utilization of resources and processes is the primary concern that the institution will be geared through.

Conclusions and Recommendations:-

A 'usually' E-Readiness rating was obtained among teachers and students. Similarly, an 'Intermediate' level of performance satisfaction by faculty and support staff were determined.

The assessment revealed 'low' implementations on the different ICT infrastructure dimension.

However, the implementation of the strategic plan revealed that half of the academic programs, support services, general administration on IT and software developments were readily implemented. On the other hand, a 'low' ICT implementation of ICT vision, plan, policies, and standards, skill development and technical support was ascertained. A 'satisfactory' implementation of administrative and resource support and an 'unsatisfactory' level of satisfaction of usage of the UNP LMS tools and features were also ascertained.

A 'partially adequate' level of capability maturity of E-Learning also manifested.

Based on the results gathered, the elements of the framework consists of the following: 1) revamped strategic ICT Strategic Plan, ICT policies and standards for governance in the development and implementation of policies on instructions and education for ICT curriculum integration and administrative function on sustainability and productivity of available resources; 2) the emergence of a new ICT management and support unit (UICTC and IRM Office) which are responsible for managing ICT budgeting and finance, resource, ICT policy and best practice, and provision ICT services, skills development and technical support; sustainable ICT infrastructure (Data Communication Infrastructure, Common Network Services, Hardware and Software) –a better and suitable platform for implementing E-Learning and ICT support within the university; 3) materialization of the MIS Office for E-Learning management and implementation; 4) an Academic Affairs that oversees the E-Learning implementation; 5) E-Learning policies and standards that provide right usage and standard utilization of E-Learning; 6) a suitable E-Learning strategic plan; improved ICT and E-Learning skills of faculty and staff; 7) a UNP LMS that is compliant

to existing E-Learning standards and cater to students' diverse learning abilities; 8) stakeholders identification, responsibility and needs assessment; 9) institutional plan that would govern E-Learning; 10) a capability dimension cycle; 11) E-Readiness of stakeholders; and 12) UNP mission vision that will synchronize all the components of the framework.

This study was able to establish a well-adapted framework that could address E-Learning implementation challenges in UNP.

Considering the preceding conclusions, the following recommendations were offered:

1. The promotion of the E-learning framework for UNP needs further inputs from the administration that emphasizes on sustainable ICT strategic plan to cater the E-learning implementation and institutionalization, develops concrete policies and guidelines in promoting E-learning system, focuses on continuous development plan for improvement of the teaching-learning capability of the users as well as the efficiency of the system;
2. Diversity in learning should be intensively looked into which primarily aims to help students who have difficulties in going to the hassles of routine classes, physically challenged individuals who are willing to learn and working students who compensate for their own schooling needs.
3. Future studies must be conducted in line with the correlation and comparison between E-learning curriculum satisfaction and psychosocial behaviors among students; feasibility studies on sustainability and productivity of E-learning system.
4. Enhanced seminar training, seminars and workshops for faculty members on computer aided design.
5. Continuous monitoring and evaluation on the level of satisfaction by encouraging students to manipulate the UNP LMS features must be conducted.

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