ABSTRACT

This study developed a web portal for the Philippine Science High School – Ilocos Region Campus (PSHS-IRC). It also determined the profile of the PSHS-IRC; level of awareness and need for inclusion in the development; level of accessibility and adequacy of facilities and sources for Internet access; development of the school web portal prototype, its degree of usability; and the development of web portal for PSHS-IRC. This study is a descriptive-developmental research which made use of questionnaire and face to face interview in gathering data in Phase I (Descriptive). Software Development Life Cycle (SDLC) was used to tackle Phase 2 of the study (Development of the Web Portal). It was concluded that the school, users, stakeholders’ background, and technical requirements are essential data to be considered to address constraints and weaknesses in the development. Awareness and need for school information of the target user plays an important aspect in the development and inclusion of web portal content. Accessibility and adequacy on internet sources and facilities contributes to the portal access. Identifying requirements guide the developer designed a prototype web portal that is suitable to users and stakeholders. PSHS-IRC Web Portal is ready for use with the URL www.irc.pshs.edu.ph.

Keywords: Web Portal, Profile Determination, PSHS-IRC, Descriptive-Developmental Research

1. INTRODUCTION

The Philippine Science High School System (PSHSS) is under the Department of Science and Technology (DOST), wherein it focuses on the development and nurturing of deserving students in the fields of Science, Mathematics and Technology at the secondary level from different regions of the nation. This was established under Republic Act no. 8496 known as the "Philippine Science High School (PSHS) System Act of 1997," instituting science and technology scholarships nationwide in consonance to Republic Act no. 7687, also known as the Science and Technology Scholarship Act of 1994.

To give equal chances to all incoming freshmen scholars nationwide, and to widen the scope of governance of PSHSS, another act was enacted during the Eleventh Congress’ Third Regular meeting, which is a consolidation of Senate Bill No. 2113 and House Bill Nos. 8134 and 11651, later on passed as Republic Act No. 9036 - An Act strengthening the governance and defining the scope of the Philippine Science High School System, amending for the purpose Republic Act No. 8496.

From the year of existence of the Philippine Science High School – Ilocos Region Campus (PSHS-IRC) in 2003, it has been known in Region 1 for providing the latest and updated delivery of quality academics for deserving students. Students from the entire region and other regions enrolled in this campus once they passed the two-shot examination for the admission and complied with other requirements. Admitted students are required to live on campus; and since they come from all over the regions, they are distantly located from their families, other alumni and other target stakeholders.

Dissemination of information to parents, students, alumni, and other schools outside Region 1 incurs additional costs, since printing and photocopying of letters, memos, reminders, programs, and other related communications is not only cumbersome but tedious and expensive to send out. Also, communication of school activities to the Department of Education (DepED) primary and secondary level is very difficult to reach them, because our school activities and information is not only for the municipality of San Ildefonso where the school is located but also to other divisions. Thus, the school really needs this proposed school web portal for faster and easier access of any documents/information posted on it.

The school also needs to adhere to the computerization act known as Electronic Commerce Act of 2000, which states that:
All organizations must be updated with those kinds of technology. It is either in the way of enhancing their process or hooked up in the development of system to minimize the manual processing of papers or transactions with the people for quality service.

Therefore, the researcher believes that the present study is a great response to the challenge of technology. This will serve as another medium to improve the school’s processes in disseminating information to stakeholders either inside or outside entities.

The development of the PSHS Ilocos Region Campus Web Portal follows the input – process – output model shown in Figure 1.

The input consist of the profile of PSHS-IRC along enrolment, ratio, internet connectivity; faculty and students in terms of computer literacy, computer skills, experience in internet access, special trainings attended, and computer ownership; the campus portal technical requirements that includes functional, non-functional, regulatory and external interface requirements; the extent of awareness and need for the inclusion in the development of PSHS-IRC web portal; and the level of adequacy and accessibility of facilities/sources for internet access.

The process requires an analysis of profile, the extent of awareness and need for inclusion in the development of PSHS-IRC web portal and the adequacy & accessibility of facilities and technical requirement analysis using documentary and interview. It also includes the development of web portal using the Software Development Life Cycle such as system analysis, system design, system development and documentation of the web portal prototype and the validation in terms of usability along attractiveness, control, efficiency, helpfulness, learnability, interactivity, and acceptability in order to develop the prototype, which was subjected to usability testing / validation, to come up with the PSHS Ilocos Region Campus Web Portal.

2. LITERATURE

PROFILE OF PSHS-IRC

Enrollment in the public secondary schools has rapidly grown over the past decades. In line with this concern, various schools with different and specialized curriculum along sciences and mathematics were established. More and more enrollees are embarking into schools with special science curriculum such as the Rizal National Science High School. This could be due to the fact that the school implements a special curriculum that will cater to the technological and socio-economic demands of the community and will establish a linkage with local industries and business to provide additional technical knowledge and actual work experience for students.1

Student-Teacher ratio refers to the number of teachers in a school or university in proportion to the number of students who attend the institution. For example, a student teacher ratio of 10:1 indicates that there are 10 students for every one teacher. The term can also be reversed to create a teacher-student ratio. In the previous example, the teacher-student ratio would be 1:10.

FACULTY AND STUDENTS’ PROFILE

The study of Erdem\textsuperscript{2} entitled “Self-Efficacy Levels of Teachers and Computer Literacy,” stressed out that the teacher’s information and computer-self-efficacy beliefs would provide us with clues about whether they find activities necessitating information literacy important for their personal and professional lives and whether they are able to design environments conducive to the acquisition of these skills by students. The study was carried out among 68 teachers chosen randomly from three public schools and two private primary schools. The results reveal that most teachers’ self-efficacy for information literacy and computer literacy are at high. The meaningful differences exist between teachers with different computer literacy self-efficacy level with regard to their information literacy self-efficacy levels and the meaningful differences are between the first and third and the second and third stages. They believe that students gained skills of reaching information, literature review, referencing.

A survey conducted by Maharana\textsuperscript{3} on “Digital Information Literacy of Faculty” at Sambalpur University pointed out that computers have become a necessary part of this digital society, and skills for computer use are a common prerequisite on many job applications. The researcher found out the 98.57\% of faculty members who responded to the survey expressed their need for electronic information in addition to traditional print sources; 82.86\% respondents indicated that they use e-journals. However, e-articles, e-thesis and dissertations and e-databases are used by more than 50\% of the faculty. Other forms of e-information such as e-book, subject gateways, e-archives are less popular among the teaching community; majority of faculty use e-information in order to update their knowledge in their respective subject area. More than 60\% use e-resources for the purpose of research support, preparation of course materials, and preparation of scholarly articles for publication. Further, concluded that there is an educational imbalance between the rapidly developing technologies and information available to the users. Educating people to use information technologies is becoming an important educational objective for the teaching and research community. Universities should take a lead role in spreading knowledge of digital information resources.

PORTAL REQUIREMENTS ANALYSIS

In order to attain success and be able to achieve those advantages presented of having a web portal, any organization should undergo a thorough analysis of the specific requirements. Requirements analysis is the process of identifying the important features to be included in the development of web portal. According to NYS Project Management Guidebook\textsuperscript{4}:

“The primary goal of this phase is to create a detailed Functional Specification defining the full set of system capabilities to be implemented, along with accompanying data and process models illustrating the information to be managed and the processes to be supported by the new system. The Functional Specification will evolve throughout this phase of the Software Development Life Cycle (SDLC) as detailed business requirements are captured, and as supporting process and data models are created, ensuring that the eventual solution provides the Customers with the functionality they need to meet their stated business objectives.”

Further, Grady\textsuperscript{5} of JOG Systems Engineering Inc., cites that Systems Requirement Analysis gives the professional systems engineer the tools to set up a proper and effective analysis of the resources, schedules and parts that will be needed in order to successfully undertake and complete any large, complex project.

EXTENT OF AWARENESS AND NEED


According to D'Arcy in his article in Information System Research entitled “User Awareness of Security Countermeasures and Its Impact on Information Systems Misuse: A Deterrence Approach,” intentional insider misuse of information systems resources represents a significant threat to organizations. For example, industry statistics suggest that between 50%–75% of security incidents originate from within an organization. Because of the large number of misuse incidents, it has become important to understand how to reduce such behavior.

Olzak discussed that user awareness is an essential part of information security. The existence of policies, standards, and guidelines must be known to the employees that handle your data and manage your infrastructure. User awareness is part of the administrative foundation of a secure information processing environment. It is through an effective awareness program that a desire to meet policy objectives becomes part of your organization's culture.

LEVEL OF ADEQUACY AND ACCESSIBILITY OF FACULTIES AND SOURCES OF INTERNET ACCESS

According to the study of Nkansah and Amankwa entitled “Adequacy, Accessibility, and Goodness of Data,” the impact of information technology in the industrialized world is dramatic and the trend is continuing at an exponential rate with global implications. In contrast, the impact of information technology in developing countries is marginal, with only a few countries daring to travel on the information superhighway. One fundamental reason for the lag in the utilization of information technology in developing countries is the absence of basic data. This article explores the possible causes of this lack of basic data by examining the normative factors, cultural and exotic, embedded in the current practices of collecting, storing, and accessing data in Ghana, a developing country.

PROTOTYPE WEB PORTAL

Before committing to a full-scale software implementation, software prototyping is a cost effective way in which to explore the viability of ideas by identifying potential “black holes”, red flagging issues requiring further research, and providing something real which can be demonstrated to potential customers and/or investors.

The principal use of prototype is to help customers and developers understand the requirements for the system. Understanding requirements of the system is a very important matter to be considered in the development, because it would be a path or good to be used the creation of prototype as well.

WEB PORTAL

You can now join more mailing lists than you will ever have time to read. There is an abundance of information on every topic and subject and you can spend hours on forums, chats or reading blogs. The internet has allowed networking and making new business relationships. Traditional means of advertising have been challenged by internet advertising which is one of the fastest growing industries.

The above-cited literature plays an important role in constructing the proposed website of the school. It guides the researcher in the analysis of the requirements in four dimensions of requirements. Likewise, the development of the prototype is vital from the requirements identified. Since the hardest

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part of study is on the testing of the usability, the researcher made use of the pattern adopted by Landauer and Nielsen\textsuperscript{12} to avoid overlapping of ideas and minimize cost as well.

3. STATEMENT OF THE PROBLEM

The study aimed to develop a Web Portal for Philippine Science High School – Ilocos Region Campus. Specifically, it sought answers to the following problems:

1. What is the profile of the following:
   a. PSHS-IRC
      - Enrollment
      - Ratio
      Teacher-Student
      Teacher-Computer
      Student – Computer
      - Internet Connectivity
         • ISP
         • Bandwidth
         • Nature of Connectivity
   b. Faculty
      - Computer literacy
      - Computer skills
      - Experience in Internet Access
      - Special Trainings Attended
      - Computer ownership
   c. Students
      - Computer literacy
      - Computer skills
      - Experience in Internet access
      - Special trainings attended
      - Computer ownership

2. What are the Campus Web Portal technical requirements along the following:
   a. Functional Requirements;
   b. Non-Functional Requirement;
   c. Regulatory Requirement; and
   d. External Interface Requirement?

3. What is the level of awareness and need for the inclusion in the development PSHS-IRC Web Portal along the following:
   a. Mission, Goals and Objectives (MGO);
   b. Administration;
   c. Curriculum and Instruction;
   d. Faculty;
   e. Students;
   f. Research;
   g. Extension;
   h. Library Services;
   i. Laboratory;
   j. Physical Facilities;
   k. Alumni;
   l. Opportunities (Career, Bid and other Announcements);

4. What is the level of adequacy and accessibility of facilities and sources for Internet access?

5. What prototype school web portal can be developed?

6. What is the degree of usability of the prototype web portal in terms of the following dimensions:
   a. Attractiveness;
   b. Control;
   c. Efficiency;
   d. Helpfulness;
   e. Learnability;
   f. Interactivity; and
   g. Acceptability

7. What web portal can be developed for the Philippine Science High School – Ilocos Region Campus?

4. METHODS AND PROCEDURE

Descriptive – developmental research design was used in the study. Descriptive research design is a scientific method which involves observing and describing the behavior of a subject\textsuperscript{13}.

Developmental research was utilized because this study further focused on the development of a prototype web portal based from the gathered information from the respondents. The final output was a usable/acceptable web portal for Philippine Science High School – Ilocos Region Campus. According to Richey\textsuperscript{14}, developmental research involves situations in which the product-


The development process is analyzed and described, and the final product is evaluated, focuses more on the impact of the product on the learner or the organization, and it is oriented toward a general analysis of design development or evaluation processes as a whole or as components.

Respondents of the study were students who are currently enrolled from first year to fourth year school year 2009-2010 (207) and faculty members (21) who are currently teaching at PSHS-IRC. There are 228 respondents from the two groups. Total enumeration was done for the respondents to get the profile, level of awareness and need, extent of adequacy and accessibility of internet sources.

For usability testing, the idea of Landauer and Nielsen\(^\text{15}\) to have 3 to 5 validators in every group was adopted. According to him, there is no need to include as many members of each group as you would in a single test of a single group of users. The overlap between observations will ensure a better outcome from testing a smaller number of people in each group. These selected validators were taken from the respondents of the study.

Thus, the process of selecting members of the validators in each group was done in the analysis of the respondent’s profile. Purposive sampling was employed in a manner that they should have knowledge in browsing and surfing the net so that they can evaluate and relate to the questionnaires administered to them. Additional five (5) experts in the field served also as validators to test the usability of the web portal. To test and validate the web portal prototype, three (3) validators from each group of students, alumni, and faculty, administrators and five (5) expert evaluators.

For the instrumentation, the study has two (2) phases, descriptive and developmental phases. Phase 1 mainly used the questionnaire to gather data such as profile, awareness and need, adequacy and accessibility of facilities/sources for Internet access, and usability testing.

In the portal technical requirements analysis of the proposed web portal, the researcher used a structured form of questionnaire to gather and define the functional, non-functional, regulatory, and external interface requirements of the study from the different groups based from the study of Ancheta\(^\text{16}\) but revisions were made to fit the current study.

Phase 2 was on the developmental phase of the research that focused on the development of the school web portal. Firstly, it developed the school portal based on the result of the requirement analysis following the steps on Software Development Life Cycle (SDLC).

Apache for an active system server and Apache’s modular architecture allows you to build a server that is "made to measure."\(^\text{17}\)

MySQL for the queries and support primary keys, along with key indices which allow you to speed up queries and constrain input.\(^\text{18}\)

Cascading Style Sheet (CSS) for the uniformity of design in every pages of the web portal and can define different ways of content display based on the media.\(^\text{19}\)

Hypertext Mark-up Language (HTML) for the design of the forms and display Web pages with a wide range of colors, shapes, and objects.\(^\text{20}\)

Hypertext Preprocessor (PHP) for the codings and it was used for creating dynamic web pages that


interact with the user offering customized information\textsuperscript{22}.

From the identified requirements and softwares, the researcher developed a prototype and further subjected it to evaluation. Evaluation was part of the process in order to validate the usability of the proposed web portal. A questionnaire was given to the validators/testers in order to test the usability of the web portal in different dimensions. Their feedback were documented and served as basis for the development of the functional portal of the school.

Secondly, to describe the level of the usability of the proposed web portal of Philippine Science High School – Ilocos Region Campus was described in terms of its attractiveness or the degree to which users like the site, whether they find the site pleasant to use; control or degree to which users feel ‘in charge’, whether the site allows them to navigate through it with ease, and whether the site communicates with them about what it is doing; efficiency or degree to which users feel that the site has the information they are looking for, that it works at a reasonable speed and is adapted to their browser; helpfulness or degree to which users feel that the site enables them to solve their problems with finding information and navigating; learnability or degree to which users feel they can get to use the site if they come into it for the first time and the degree to which they feel they can learn to use other facilities or access other information once they have started using it\textsuperscript{23}; interactivity is the way the web portal responds to the actions of the end-user; and acceptability is the satisfactoriness of users in browsing the web portal.

In testing the usability of the portal, the developed questionnaire was patterned from three tools namely; (1) Heuristic Evaluation Approach of Xerox Corporation, (2) the 25-point Website Usability Checklist, Software Usability Measurement Inventory, and (3) Website Analysis and Measurement Inventory.

A five point scale was used having descriptive equivalents ranging from strongly agree to strongly disagree for the usability testing and very high awareness/need to poor awareness/need for the level of awareness and need of the respondents which was adapted from the study of Ancheta\textsuperscript{24}.

To establish validity, the questionnaire was presented to the researcher’s adviser for corrections/suggestions and recommendations. Then, it was further polished/ improved by the Oral Examination Committee (OrEC) and finally their approval was solicited.

To obtain the reliability, the questionnaire on awareness and need for inclusion, and adequacy and accessibility of facilities and sources of internet access was pilot-tested to 30 respondents who were not included in the study. It was piloted in Belen National High School, San Ildefonso, Ilocos Sur and computed using Cronbach Alpha. It gave the result of 0.88 denoting a high reliability. Thus, the questionnaire used was reliable.

The validation of the web portal was done through usability testing adopted from SUMI and WAMMI. This instrument was also adopted by Ancheta\textsuperscript{25} in his dissertation entitled “Web Portal of the DMMMSU Graduate College for Electronic Theses and Dissertations.” The instrument was no longer piloted for reliability since this is a standard test as Griffiths\textsuperscript{26} explanation on validity:

\begin{quote}
Confidence in the validity of a questionnaire can be developed by demonstrating its consistency with other measures for the quality that it is intended to measure, e.g., other questionnaires or standards checklists
\end{quote}

To determine the profile, a frequency count was utilized. The extent of awareness and need for the inclusion of items like mission, goals, objectives, administration, curriculum and instruction in the development of the web portal, frequency counts was used. The level of adequacy and accessibility, frequency count was also used. The portal technical requirements were presented in descriptive format.


\textsuperscript{26} Griffiths, Richard 2009. “Usability Evaluation by Query Techniques”
The level of validity in terms of usability along attractiveness, control, efficiency, helpfulness, learnability, interactivity and acceptability was computed using weighted means.

5. RESULTS AND DISCUSSION

PROFILE PSHS-IRC

The profile of PSHS-IRC includes enrollment, ratio of student to faculty, student to computer, and faculty to computer; and internet connectivity.

The enrolment of PSHS-IRC for the school year 2009-2010 is shown in the figure below. It can be noted that there are 65 students from the first year, 49 for the second and third year, and 44 for the fourth year with a total of 207 students.

The PSHS-IRC has twenty-one faculty members to implement the curriculum of the PSHS System, thus, the ratio of teacher to student is 1:10. Computer ratio is 1:1, since the school has two (2) computer laboratories that are equipped with 56 computers. Faculty to computer ratio is 2:1. It is also worth noting that every unit of the school has its own computer for instructional purposes. These confirmed the idea of Kumar (2010) that ratios are indicative of possible changes of the school. The findings implied that PSHS-IRC is equipped with computers to cater the need of the students in their laboratory works and the faculty in the preparation of their reports. Further, faculty to student ratio is low which means that the number of students to be supervised by a teacher is manageable.

PSHS-IRC is using the wireless connectivity through Smart Broadband (SMARTBRO) Communication of SMART Network having a corporate account supplying 1024 kbps as the bandwidth. The findings reflected the use of wireless technology in connecting to internet service with an excellent speed to sustain the download and upload activities of the administrator, faculty, staff, and students of PSHS-IRC community. According to Craig (2008), the idea of internet connection along speed depends on the bandwidth which refers to how much data can be downloaded from the service provider. Further, he pointed out that the good internet connection is in ADSL service. Thus, it’s highly suggested that PSHS-IRC should sustain or apply for a higher bandwidth to support an excellent internet connection.

CAMPUS PORTAL TECHNICAL REQUIREMENTS

The development of the PSHS-IRC prototype requires the following functional requirements like browsing scheme, breadcrumbs, site map, search tools, etc; non-functional requirements such as performance, reliability, security, efficiency, speed, and hardware requirement; regulatory requirements such as restrictions and file format; and external interface requirements such as text visibility, link consistency, color combination and graphics layout. Based from the requirements identified the school prototype was developed as presented in the virtual structure of the portal below:

LEVEL OF AWARENESS AND NEED FOR THE INCLUSION IN THE DEVELOPMENT OF PSHS-IRC WEB PORTAL

The level of awareness and the level of need in the inclusion of some items like MGO, faculty, students, research, etc., in the development of the portal are presented in table below.

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Table 1. Level of Awareness and Need for the Inclusion in the Development of PSHS-IRC Web Portal

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Awareness Mean</th>
<th>Need DE</th>
<th>Need Mean</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission, Goals and Objectives</td>
<td>3.51</td>
<td>HA</td>
<td>3.95</td>
<td>HN</td>
</tr>
<tr>
<td>Administration</td>
<td>3.23</td>
<td>MA</td>
<td>3.74</td>
<td>HN</td>
</tr>
<tr>
<td>Curriculum and Instruction</td>
<td>3.53</td>
<td>HA</td>
<td>3.93</td>
<td>HN</td>
</tr>
<tr>
<td>Faculty</td>
<td>3.62</td>
<td>HA</td>
<td>3.92</td>
<td>HN</td>
</tr>
<tr>
<td>Student</td>
<td>3.61</td>
<td>HA</td>
<td>3.91</td>
<td>HN</td>
</tr>
<tr>
<td>Research</td>
<td>3.35</td>
<td>MA</td>
<td>4.07</td>
<td>HN</td>
</tr>
<tr>
<td>Extension</td>
<td>3.08</td>
<td>MA</td>
<td>3.80</td>
<td>HN</td>
</tr>
<tr>
<td>Library Services</td>
<td>3.17</td>
<td>MA</td>
<td>3.85</td>
<td>HN</td>
</tr>
<tr>
<td>Laboratories</td>
<td>3.29</td>
<td>HA</td>
<td>4.03</td>
<td>HN</td>
</tr>
<tr>
<td>Physical Plant/Infrastructure</td>
<td>3.21</td>
<td>HA</td>
<td>3.93</td>
<td>HN</td>
</tr>
<tr>
<td>Alumni</td>
<td>3.04</td>
<td>MA</td>
<td>3.79</td>
<td>HN</td>
</tr>
<tr>
<td>Opportunities (Career and Bid Announcements)</td>
<td>3.08</td>
<td>MA</td>
<td>4.02</td>
<td>HN</td>
</tr>
<tr>
<td>GRAND MEAN</td>
<td>3.31</td>
<td>MA</td>
<td>3.91</td>
<td>HN</td>
</tr>
</tbody>
</table>

Legend: HA / HN=High Awareness / Highly Needed MA / MN=Moderate Awareness / Moderately Needed

Findings in the table coincide with the idea that the awareness of the respondents falls under the first level also known as the basic consciousness. The respondents were aware on the indicators presented in the table but they don’t bother to question or wonder. Moreover, agreed to include all the indicators in the development of the school web portal.

LEVEL OF ADEQUACY AND ACCESSIBILITY OF FACILITIES AND SOURCES FOR INTERNET ACCESS

The level of adequacy and accessibility of facilities and sources for internet access is below.

<table>
<thead>
<tr>
<th>Facilities/Sources of Internet Access</th>
<th>Accessibility Mean</th>
<th>Adequacy DE</th>
<th>Need Mean</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-line Settings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>3.96</td>
<td>HA</td>
<td>3.89</td>
<td>HA</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>3.62</td>
<td>HA</td>
<td>3.49</td>
<td>HA</td>
</tr>
</tbody>
</table>

Legend: HA =Highly Adequate / Accessible MA =Moderately Accessible/Adequate

Findings on level of adequacy of facilities and sources for internet access got a weighted mean of 3.49 or highly adequate descriptive rating. It means that there are adequate or plenty of facilities and sources and venues by which users can have access to the internet.

This result coincides with the goal of HealthLink to set standards on availability and accessibility of website to the intended users. Also, it confirms the suggestions of Nkansah and Amankwaa in their study that to have a good access of data, the portal should solve the problems associated with the current practices of recording, storing, and accessing data.

DEGREE OF USABILITY OF THE WEB PORTAL PROTOTYPE

As a part of the implementation process, testing of the usability was done in order to determine the

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degree of usability that the prototype web portal has. This was administered to 21 respondents coming from different groups. There were three validators from the group of scholars, alumni, parents, outsiders, and administrators. There were nine (9) IT experts who validated the web portal in order that the technical aspect of the web portal may be tested properly.

The researcher made use of the 5 point Likert scale to interpret the degree of usability on the following aspects: attractiveness, control, efficiency, helpfulness, learnability, interactivity, and acceptability. The results are shown below:

There was a strong agreement from the validators having a grand mean of 4.25. This means that the developed school web portal is very usable.

Taken individually, interactivity got the highest mean of 4.72 which is strongly agree; followed by acceptability (4.43), efficiency (4.37), attractiveness (4.24), and control (4.23). All those indicators were described as strongly agree.

The strong agreement on the degree of usability of the developed school portal means that it is functional and usable as an alternative medium of communication of the schools to the target users and browsers. Further, it is less-aesthetic portal for serious/regular usage as compared between Gmail and Yahoo mail and users can easily move from one page to the other page using the breadcrumbs, it is efficient and has a good design.

Moreover, the developed portal allows users to navigate with ease and communicate about what it is doing. This is in consonance to the idea of Nielse that learnability indicator in the degree of usability of Web Portal becomes the most important element in terms of usability.

6. WEB PORTAL FOR PHILIPPINE SCIENCE HIGH SCHOOL - ILOCOS REGION CAMPUS

With the high/strongly agree level of usability testing as reflected in the mean rating of 4.25 and after integrating all the gathered requirements, implementing the virtual structure and process flow, and designing the menus as an engine in navigation scheme, a usable/functional web portal was developed as shown below and accessible at http://www.irc.pshs.edu.ph.

Main menu includes the Home, PSHS IRC History, Mission and Vision, PSHS Hymn, Organizational Structure, Faculty and Student, Curriculum and Instruction, Research, Extension Program, Library, Laboratory, Physical Facilities, and New Announcements.

Top Menu includes the Achievements, Downloads, Opportunities, Contacts and Sitemap. Additional features for interactivity include the PHISCI Connectivity for blogging of the registered

users, PTA Updates, Photo Gallery, Alumni Corner, and the Log-in Form.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings by the researcher, the following conclusions were drawn:

1. The school, users, stakeholders’ background, and technical requirements are essential data to be considered in the development of the proposed school web portal.
2. Campus technical requirements are essential to consider in the analysis and development of the school web portal.
3. Awareness and need for school data/information of the target user plays an important aspect in the development and inclusion of web portal content for a better access and information sharing of the school and its stakeholders.
4. Adequacy and accessibility on internet sources and facilities contribute to the portal access and used.
5. Identifying requirements guide, the developer-designed a prototype web portal that is suitable to users and stakeholders.
6. The developed prototype is ready for use of the faculty and staff, students and stakeholders of PSHS-IRC.
7. Existence of PSHS-IRC web portal in the cyberspace can be accessed with an IP Address or domain name of www.pshs-irc.edu.ph.

Based from the findings and conclusions the following recommendations were drawn in order that the developed school portal is accessible and user-friendly to every user:

1. Profiling of school data/information faculty and students should be readily available to support whatever purpose it may serve such as the development of a web portal to have a clear direction in the project implementation.
2. Technical requirements analysis of a web portal or system should be considered as the first step in the web portal development.
3. Content management of the web portal should involve the users as to their needs vis-à-vis with technical requirements for the successful development of a web portal.
4. Internet sources and facilities such as internet provider, computers/laptops, and other hardware internet devices must be taken into consideration in the development of the web portal for a better and wider access to information of the school.
5. Prototyping scheme is highly recommended to implement the trial and error development. This may be done by a partial development of the web portal then test/validate for further revisions until such feature works properly and necessitates the support of the administration.
6. Usability testing should be part of the entire development to avoid bugs and to facilitate an efficient and effective access by users. This should be supported again by the researcher, developer, and administrators.
7. The developed web portal for the Philippine Science High School – Ilocos Region Campus is recommended for use and must be utilized as an alternative/additional communication system to the target user to minimize expenses cost in communication.
8. It is highly recommended for future researchers to conduct further studies related to this present study and in line with web portal development which should also include the maintenance stage as part of the entire cycle.

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