Effectiveness of the Computer and Internet Literacy Project in Public High Schools of Tarlac Province, Philippines

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ABSTRACT
Evaluation is important to gauge the strengths, weaknesses and effectiveness of any activity. This study evaluated the iSchools Project implemented in the Public High Schools of Tarlac Province, Philippines by the Commission on Information and Communications Technology (CICT) in partnership with the selected State Universities and Colleges. Using survey questionnaires, data were gathered from the public high school teachers who were the recipients of the project. To supplement data from the survey, interviews with Principals and ICT Coordinators and actual observation of classes in the laboratory were also done. Findings showed that the beneficiary schools encountered problems in project implementation. These problems include hardware failure, difficulty on the use of software package, lack of follow-up on capability building, no available internet connection, limited access to the laboratory, and lack of repair/maintenance of the equipment in the laboratory. Despite these problems, however, the project was rated by the teachers as very satisfactory in terms of project administration, project components, and project delivery system. This implies that the project in general was effective in attaining its objectives which is ICT integration in education and to bridge the digital divide among public high school teachers.

Keywords: Computer and Internet Literacy Project, Educational Technology, Teacher Training, ICT Integration

INTRODUCTION
Technology nowadays has become prevalent in our society. It revolutionized the way people see and appreciate things especially in the fields of education. Teachers, parents and students now realize their significance in the quest for knowledge in this age of information technology. It makes the teacher's task easier while sustaining a high level of interest among their students.

Information and Communications Technology (ICT) in the Philippines is a milestone in the educational system. It opens a wide variety of opportunities both for teachers and students. Transferring of information, collecting of data and researching are the multiple benefits that people can get from ICT, but it still a dream for many. Most public schools in the Philippines have no complete ICT facilities and most teachers are not ICT literate which results in poor student and school performance.

The iSchools Project in the Public High Schools of Tarlac Province is one of the projects of the former Commission on Information and Communications Technology (CICT) which is now Information and Communications Technology Office (ICTO) which supports the efforts of the Department of Education to integrate ICT in education. Its goal is to contribute to the efforts of the Philippine government in bridging the digital divide by developing an educational digital network that equips public high school teachers with ICT literacy skills as well as access to relevant digital content and applications in education that they may use to make learning effective (iSchools Project Scope Plan).

The project focuses on integrating ICT in education towards strengthening classroom learning and instruction by expanding access to various sources of information. The project hopes to enhance the capability of public high school students in order to successfully compete with their peers for jobs and other opportunities in the expanding global knowledge economy.

Strategies for Implementation
The CICT and the selected State Universities and Colleges (SUCs) in the Philippines, joined hands to implement the iSchools Project, from Choosing a Pilot Site, Social Preparation Activities, Deployment of computers, Training of Trainers, and Progress Monitoring. SUCs implements iSchools at the beneficiary level as project coordinators, trainers and technical consultants. This partnership was done through the Memorandum of

Agreement (MOA) between CICT and SUCs concerned. The duties and responsibilities of SUCs as stipulated in the MOA are to conduct site inspections and evaluation of proposed beneficiaries; conduct community mobilization to beneficiaries; provide technical assistance in hardware deployment and ensure smooth internet connectivity of the schools; plan, conduct and manage educators training; and conduct project monitoring and evaluation to assigned schools.

Project Life Cycle

The iSchools Project starts with selection of a Pilot Site. The proposed beneficiaries were inspected on-site by the concerned SUC personnel and informed them about the project. It is followed by social preparation phase where the Principal, Teachers, Parents Teachers Association (PTA) Officers and other stakeholders of the selected beneficiary schools were invited for a project briefing. Details of the project are discussed including their counterpart responsibility. Then, community mobilizations were conducted on-site to discuss the projects with the teachers, students, parents, community officials and other stakeholders for their acceptance of the project. After which, sustainability planning workshop was conducted to the recipient schools to provide them knowledge and skills on how to sustain the project after its implementation. This was attended by the principal, teachers and PTA representatives. After the social preparation phase, deployment of hardware was done to the beneficiary schools. Pre-requisites for deployment are readiness of the laboratory room such as electrical wirings, paintings, door locks, grills, computer tables and chairs, physical security of the laboratory to safeguard the equipment and Memorandum of Agreements (MOA) signed by the concerned stakeholders for the sustainability of the project. After the deployment, capability buildings were conducted to the teachers of the recipient schools. Trainings include Computer & Internet Literacy Course (CILC) for twenty (20) teachers which was conducted on-site, Laboratory Management for the designated laboratory manager and assistant, Website Development Training for two teachers, Library Management for the designated librarian of the school, and ICT Integration on teaching Science English & Math. The last stage of the project was the Project Closure where Deeds of Donation of the laboratory were given to the beneficiary schools.

Project Components

Under the iSchools Project, schools were provided with 20 computer units, 1 server, 1 printer, 1 projector, 2 air-conditioning units, 1 wireless router, one year free internet connection, as well as relevant educators training in the use of ICT in education. Trainings include Computer & Internet Literacy Course (CILC) for twenty (20) teachers which was conducted on-site, Laboratory Management for the designated laboratory manager and assistant, Website Development Training for two teachers, Library Management for the designated librarian of the school, and ICT Integration in teaching Science English & Math. Strengthened partnerships with Local Government Units (LGU), PTA and other local educational stakeholders were also part of the components of the project.

The project had been implemented several years ago and evaluation of this project is an integral part of the development process to determine its effectiveness which can be the basis of improving future similar activities. Hence, this study was conducted to evaluate the effectiveness of the iSchools project in public high schools of Tarlac Province.

Statement of the Problem

This study was sought to answer the following questions:
1. How is the iSchools Project in Public High Schools of Tarlac Province evaluated in terms of its effectiveness?
2. What are the problems encountered in the implementation of the project?

Significance of the Study

The result of this study will serve as an assessment in determining the strengths and weaknesses of the project. The findings will be used as a benchmark in improving the implementation of similar projects in the future. The project administrators, beneficiary teachers and other stakeholders of the educational system will be benefited through the information that may be derived from this study.

The administrator of this project will make use of the findings a basis in improving aspects of project needing improvement. This includes improvement on the project management, project implementation, project components, capability building for teachers, utilization and maintenance of the laboratory and sustainability of the project. The beneficiary public high schools which include teachers, students, parents and community will utilize the findings in adapting measures to help the administrators in implementing the project successfully and to make use of the project in integrating ICT in education to produce quality, competitive and ICT literate graduates.

Scope and Delimitation

This study focused on evaluating the effectiveness of the iSchools Project in the Public High Schools of Tarlac Province, Philippines in terms of project administration, project components, project delivery system and project effectiveness. This study also determined the problems encountered by the recipient schools in the implementation and sustainability of the project.

METHODS AND PROCEDURE

This chapter presents the research design, description of the subjects, data gathering tools and procedure, and statistical treatments used.

Research Design

This study made use of the descriptive research design and the CIPP evaluation model developed by Donald Stufflebeam in 1971. The CIPP stands for the core concepts of the model: Context evaluation, Input evaluation, Process evaluation and Products evaluation. This model recognizes types of decisions encountered in education planning, programming, implementing of projects and recycling. This model is suitable for this kind of evaluation because in this concept, evaluation is for improvement of the project. [Stufflebeam 2002].

Respondents of the Study

The respondents of this study were the schools ICT coordinator, principal and 293 teachers of the recipient public high schools in the province of Tarlac. The sample was determined using Slovin's formula. The total population [N] was 1100 and the tolerable error [e] was .05. Using the given formula, the sample [n] was 293, and this was 27% of the total population. Respondent teachers were chosen randomly from each school and distributed in all learning areas.

Data Gathering Instruments

Survey questionnaires supplemented with interview of the ICT Coordinator and Principal and observation of classes were used as tools in gathering data. Survey questionnaires were prepared based on the project scope plan of the project. The instruments' content validity was established by seeking verbal and written feedback from the principal, teacher and psychometrician.

Evaluation questionnaires on ICT literacy for teachers and ICT integration were adopted from the CICT – HCDG assessment evaluation sheet on ICT Skills survey based on the National ICT Competency Standards [NICS] for teachers.

Data Analysis

The data gathered were tabulated, organized, analyzed and interpreted using appropriate statistical tools.

The data on the evaluation of project administration, project components and project delivery system were interpreted using frequency and means. The criteria on project administration, project components and project delivery system were rated using the following scale:

5	-	*Excellent*
4	-	*Very Satisfactory*
3	-	*Satisfactory*
2	-	*Poor*
1	-	*Very Poor*

Weighted Means were interpreted using the following intervals and descriptions:

4.41	-	*5.0*	*Excellent*
3.41	-	*4.40*	*Very Satisfactory*
2.41	-	*3.40*	*Satisfactory*
1.41	-	*2.40*	*Poor*
1.0	-	*1.40*	*Very Poor*

The data on ICT Literacy were rated using the following Likert Scale adopted from the CICT NICS survey:

5	-	**Fully Mastered** *[The function is achieved with full competence and could be confidently explain to others].*
4	-	**Mastered** *[The function is used/done regularly and confidently].*
3	-	**Nearly Mastered** *[The function is used/done occasionally but need further practice to be confident].*
2	-	**Partly Mastered** *[Aware of the function/operation but have not experience using it].*
1	-	**Not Mastered** *[Not aware and have not tried the*

function /operation/tool].

The WM were interpreted using the following intervals and descriptions:

4.41	*-*	*5.0*	*Fully Mastered*
3.41	*-*	*4.40*	*Mastered*
2.41	*-*	*3.40*	*Nearly Mastered*
1.41	*-*	*2.40*	*Partly Mastered*
1.0	*-*	*1.40*	*Not Mastered*

The data on ICT Integration were rated using the following Likert Scale:

5	*-*	*Always*
4	*-*	*Usually*
3	*-*	*Sometimes*
2	*-*	*Seldom*
1	*-*	*Never*

The WM were interpreted using the following intervals and descriptions:

4.41	*-*	*5.0*	*Always*
3.41	*-*	*4.40*	*Usually*
2.41	*-*	*3.40*	*Sometimes*
1.41	*-*	*2.40*	*Seldom*
1.0	*-*	*1.40*	*Never*

The level of client satisfactions regarding the components of the project were rated using the following Likert Scale:

5	*-*	*Very Highly Satisfactory*
4	*-*	*Highly Satisfactory*
3	*-*	*Satisfactory*
2	*-*	*Not Satisfactory*
1	*-*	*Very not Satisfactory*

The WM were interpreted using the following intervals and descriptions:

4.41	*-*	*5.0*	*Very Highly Satisfactory*
3.41	*-*	*4.40*	*Highly Satisfactory*
2.41	*-*	*3.40*	*Satisfactory*
1.41	*-*	*2.40*	*Not Satisfactory*
1.0	*-*	*1.40*	*Very not Satisfactory*

The WM in Project Effectiveness were presented using the following intervals and descriptions:

4.41	*-*	*5.0*	*Highly Effective*
3.41	*-*	*4.40*	*Moderately Effective*
2.41	*-*	*3.40*	*Effective*
1.41	*-*	*2.40*	*Fairly Effective*
1.0	*-*	*1.40*	*Not Effective*

Frequency counts and rank were used to present data on the issues and problems encountered by the teachers in the implementation of the project.

RESULTS AND DISCUSSIONS

Evaluation of the project includes project administration, project components, delivery system and project effectiveness. These are the factors that determine whether the project was implemented effectively and whether the goals were attained based on the evaluation of the recipients of the project.

Project Administration

Administration of the project was done by the CICT through its eQuality program for State University and Colleges (SUCs) in the Philippines. The CICT taps the services of the SUCs that signified interests to be part of the project. The data revealed that in terms of project administration, the CICT which is the prime mover of the project was evaluated as *very satisfactory* with a mean score of 4.09. This indicated that the CICT did well in managing the project as a whole and in conducting activities related to the project

The SUCs as co-administrator of CICT in implementing project in the school level was rated *very satisfactory*, obtaining a grand mean score of 4.18. This shows that SUCs with their pool of experts, performed well in implementing the project in the public high school level. This could be attributed to the fact that the CICT conducted training courses and trainers training as part of the project management activities, to equip the personnel with the necessary knowledge and skills in conducting activities related to the project.

In general, project administration was evaluated as *very satisfactory* with a grand mean score of 4.14. This shows that the project was implemented well by the CICT and its partner SUCs to the recipient public high schools. This could be because the CICT conducted trainers' training for all rollout courses to ensure that implementers have the necessary skills required to effectively implement the project in the school level. This is also to ensure the uniformity in approach, standard of modules and quality in implementation.

Project Components
The project components include the Provision of Laboratory, Capability Building for Teachers, and Local Educational and Institutional Support. Table 1 shows the evaluation of the project components as evaluated by the teachers of the recipient public high schools.

Table 1. Evaluation of the Project Components.

Project Components	Means	Description
Provision of Laboratory	4.25	Very Satisfactory
Capability Building for Teachers	3.53	Very Satisfactory
Local Educational Support	3.40	Satisfactory
Grand Mean	**3.73**	**Very Satisfactory**

As shown in the data, the provision of laboratory (Hardware, Software and Internet Connection) was rated *very satisfactory* having a composite mean of 4.25, the capability buildings for teachers conducted were rated *very satisfactory* with a composite mean of 3.53, while local educational support was evaluated *satisfactory* with a composite mean of 3.40. In overall, the project component was evaluated *very satisfactory* obtaining a grand mean score of 3.73. This can be attributed to the fact that the components provided to the beneficiary schools were relevant to their needs particularly the laboratory and training for teachers. Moreover, personnel involved in the project were properly trained and properly compensated. For these reasons, the recipient principals, teachers and other stakeholders became very cooperative and supportive of the project.

Project Delivery System
Table 2 shows the evaluation of delivery system of the project as evaluated by the teachers of the recipient schools.

Table 2. Evaluation of the Project Delivery System.

Delivery System	Means	Description
Utilization of the laboratory	4.25	Very Satisfactory
Laboratory usage in different learning areas	3.78	Very Satisfactory
ICT equipment in Education	4.46	Excellent
Productivity tools for education	3.43	Very Satisfactory
ICT integration in the laboratory	3.40	Satisfactory
Grand Mean	**3.86**	**Very Satisfactory**

The data show that the utilization of the laboratory was evaluated *very satisfactory* with a mean score of 4.25. This means that the laboratory and equipment provided were utilized by the teachers. The respondents revealed that the laboratory is utilized everyday or at least once a week. With regard to the laboratory usage in different learning areas, the respondents evaluated it *very satisfactory* having a mean score of 3.78. This means that the laboratory was utilized by teachers of different subject areas in teaching. The ICT equipment in education was evaluated *excellent* with a mean score of 4.46. This shows that the equipment given were very much suitable for ICT integration in education. The productivity tools in education were evaluated *very satisfactory* with a mean score of 3.43, which indicates that the Edubuntu and its application programs were relevant to the needs of teachers and students for education. The rating was quite low although very satisfactory because teachers need to shift from the use of proprietary software such as Microsoft into Edubuntu (open source) software. In terms of ICT integration in the laboratory, the evaluation was *satisfactory* with a mean score of 3.40. This indicated that the laboratory was an effective means in integrating ICT in education although the obtained score was not quite high. This could be because some teachers still find difficulty in integrating ICT in their lessons and can hardly shift from the traditional approach to the use of ICT.

In overall, the evaluation for project delivery system was *very satisfactory* with a grand mean score of 3.86. This revealed that the package given to the Public High Schools was utilized in accordance with its purpose of building ICT literacy and interest of public school teachers to integrate ICT in education. This can be attributed

to the observation that most of the teachers were eager to learn the use of ICT both for personal and professional development.

Project Effectiveness
Table 3 shows the evaluation of project effectiveness of the project as evaluated by the teachers of the recipient public high schools. The data presented in this table were based on the summary of points obtained in the evaluation of ICT literacy, ICT integration and client satisfaction which was transposed into effectiveness. The project was evaluated whether highly effective; moderately effective; effective; fairly effective and not effective.

Table 3. Evaluation of the Project Effectiveness.

Project Products	Means	Descriptive Rating
ICT Literacy	3.33	Effective
ICT Integration	2.77	Effective
Client Satisfaction	3.44	Moderately Effective
Grand Mean	**3.18**	**Effective**

The results show that the project was evaluated as *effective* in terms of ICT literacy and ICT integration with a mean scores of 3.33 and 2.77 respectively; while the client satisfaction was evaluated as *moderately effective* having a mean score of 3.44. In summary, the project effectiveness was evaluated as *effective* obtaining a grand mean score of 3.18. This result shows that the project in general was effective in attaining its objectives which is ICT integration in education and to bridge the digital divide among public high school teachers. This was proven by the result of evaluation on the project outcomes such as ICT literacy, ICT integration and client satisfaction.

Problems Encountered on the Laboratory
Table 4 shows the problems encountered on the provision of laboratory in the recipient public high schools. These problems encountered were classified into its sub components which are hardware, software and internet connection.

Table 4. Problems Encountered on the Learning Laboratory.

PROBLEMS ON THE LABORATORY	RANK
Hardware	
Not functional Workstations	2
Not Functional Air-conditioning Unit	4
Weak Router Signal	3
Uninterrupted Power Supply Failure	1
Software	
Corrupted Operating System	1
Internet Connection	
No Internet connection	1
Slow Internet Connection	2
Fluctuating internet connection	3

In the hardware related problems, majority was on Uninterrupted Power Supply [UPS] failure; followed by dysfunctional workstations; weak router signal; and not functional air-conditioned problems. Some of these problems were addressed by reporting them to the supplier when the units were still covered by warranty. However, after the warranty period, the repair and maintenance became the responsibility of the public high schools.

In software problem, the most common was the frequent bogged-down operating system. This was resolved by reinstalling the Edubuntu system which was the task of the designated laboratory manager who was trained to do the activity. This implied that there should be regular schedule of laboratory maintenance to avoid problems on frequent bogged-down operating system.

With regard to internet connection, the problems were no internet connection, slow internet connections and fluctuating internet connections. These problems were not within the control of the project because not all areas have internet service provider while some internet connections are dependent only on broadband signal hence, they are not stable and reliable.

Problems Encountered on Capability Building
Table 5 shows the problems encountered by the teachers of the recipient public high schools on various capability buildings conducted. The table shows that the major problem of the teachers was the lack of hands-on training on internet; it was followed by no echo training for teachers; no follow up training for teachers; lack of hands-on exercises; short training period for trainings; very fast pacing of training, and lack of skills learned on website development training. These problems occurred because of some situations which are beyond the control of the project implementers. According to the respondents, some were not given hands-on trainings on internet because during the schedule of the rollout, internet connection was not yet available. This is because in some areas, no internet service provider was available even if there were funds allotted by the project. This implied that the project implementers should look into these problems especially the hands on training on internet since this is critical for the teachers in searching various educational resources available in the web.

Table 5. Problems Encountered on Capability Building.

PROBLEMS	RANK
Lack of skills learned on website development	6.5
The Pacing of training was very fast	6.5
No follow up training for the teachers	3
Lack of hands on exercises	4.5
Short training period for the CILC	4.5
No echo training for other teachers	2
No hands-on training in internet	1

Moreover, the echo training was supposed to be initiated and implemented by the recipient schools to train other teachers also because during the trainings, only two [2] teachers per learning area participated together with the laboratory managers, principals and librarians. After the training, it was expected that the recipient schools should initiate and implement echo training to other teachers to equip them also with the knowledge and skills needed for ICT integration. However, some schools did not conduct re-echo training, hence, some teachers were not trained.

Moreover, the problem on no follow up training for teachers implied that teachers need more training to enhance their skills in using the ICT to improve their teaching skills. The lack of hands-on exercises and short period of training implied that for future project implementation, provision of more activities and longer period of training should be taken into consideration.

Problems Encountered on Utilization, and Maintenance/Sustainability of the Project.
Table 6 shows the problems encountered by the teachers of the recipient public high schools on utilization, maintenance and sustainability of the project. The table that most of the problems on utilization were on the difficulty of using Edubuntu. This was because it requires little adjustments on its functions and environment, and teachers were accustomed in using proprietary [Microsoft] software. It shows also that there were problems on insufficient number of computer units. The provision of 20 computer units and server was not enough for the public high schools to accommodate all students. The problem was not only on students but also on teachers because the higher the enrolment of the school, the higher the number of faculty the more computers are needed.

Table 6. Problems Encountered on Utilization, and Maintenance/
Sustainability of the Project

PROBLEMS	RANK
Utilization	
Limited access to the laboratory	3
No schedule on the usage of laboratory	5
Insufficient number of computer units	2
Difficulty on the use of Edubuntu	1
No available laboratory personnel	4
Maintenance/ Sustainability	
No Technical support from the Supplier	2
No available ink for the printer in the market	3
No Repair and maintenance cost provided	1
No Replacement of defective parts and units	4

Other problems on utilization were limited access to the laboratory for teachers, no available laboratory personnel, and no schedule on the usage of laboratory. The problem on limited access to the laboratory implied that teachers cannot use the laboratory because it was fully utilized or there was no proper scheduling. This was the task of the laboratory managers, to ensure that there should be functional schedule for the laboratory to give chance to all teachers who want to use it. The problem on no available personnel implied that there was no full time laboratory manager who can assist teachers in using the laboratory. This was because the designated laboratory managers were also teachers who handles various subjects and who do not stay in the laboratory. This implied that there should be full time laboratory personnel who will assist teachers in using the laboratory.

With regards to maintenance and sustainability of the laboratory, the common problem was the repair and maintenance cost. Repair was not a big problem because laboratory managers were trained in the activity however; replacements of parts such as mouse, keyboard, and ink for printer were the problems. Electric bills, payment of internet connection after the one year free connection, and payment for security personnel were also problems on the maintenance of the project. It shows also on the table that there were problems on technical support from the supplier. This implied that the school experienced problems on technical support from the supplier, according to the respondents, if there was assistance given; it took patience and perseverance to wait for their much delayed action.

Other problems of maintenance and sustainability include no available ink for the printer, and no replacement of defective parts and units. This implied that recipient schools experienced problems on the availability of ink for the printer in the market. They had difficulty looking for the ink since it was a new model. This situation made some of the schools resort to repair or replace some parts or units to make it functional and useful for ICT integration.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions
The iSchools Project was implemented and managed successfully in the recipient public high schools. The project components which include provision of laboratory equipment, and capability buildings for teachers were appreciated and fully utilized by the recipient public high schools in accordance with its purpose of building ICT literacy and interest among public school teachers in order to integrate ICT in education and improve the teaching and learning process. In general, the project was effective in attaining its objectives of bridging the digital divide and building ICT literacy and interest to the teachers of the recipient public high schools.

The problems encountered by the recipient public high schools related to hardware were: UPS failure, not functional workstations, not functional air-condition and weak router signal. In software problem, the most common was the frequent bogged-down operating system. In internet connectivity, the problems were: no available internet connection, slow internet connection, and fluctuating internet connection. In capability buildings, the problems were: no hands-on training in internet, no echo training for other teachers, no follow up training for teachers, short training period and lack of hands-on exercises. In the utilization of the laboratory, the problems were: difficulty on the use of Edubuntu software, insufficient number of computer units, limited access to laboratory and no available laboratory personnel. On maintenance and sustainability, the problems were: no technical support from the supplier, no available ink for the printer in the market, and no replacement of defective parts and units.

Recommendations
Based on the findings and conclusions of the study, it is recommended that project monitoring should be done regularly to keep track of the progress of the project and assist the schools in any problem related to the project. More durable, quality and cost efficient units/ equipment should be provided to lessen the problems of recipient school on repair and maintenance and electricity bills. Follow up training should also be conducted to the teachers to enhance their mastery of skills necessary for ICT integration. Moreover, the project should ensure that suppliers should respond immediately to the problems on repairs and replacement of parts and units which were covered by warranty to make the laboratory always functional for ICT integration.

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