

# HARNESSING THE USE OF OPEN LEARNING EXCHANGE TO SUPPORT BASIC EDUCATION IN SCIENCE AND MATHEMATICS IN THE PHILIPPINES

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# This presentation

- Some of the open learning initiatives of the Science Education Institute of the Department of Science and Technology
- Problems and Barriers
- Reforms and Solutions
  - The web-based system - The Courseware Project
    - Current status of the project
    - Upcoming and Future Plans



# Background

- 2003 Results of the Trends in International Mathematics and Science Study (TIMSS) conducted by the International Association for the Evaluation of Educational Achievement (IEA)
  - Science - ranked 23<sup>rd</sup> out of the 25 countries in Grade 4 and 42<sup>nd</sup> among 45 countries in Grade 8 (second year high school)
  - Mathematics - ranked 23<sup>rd</sup> in Grade 4 and 41<sup>st</sup> in Grade 8 (second year high school), putting the country in the bottom group along with countries like Chile, Morocco, Tunisia and South Africa



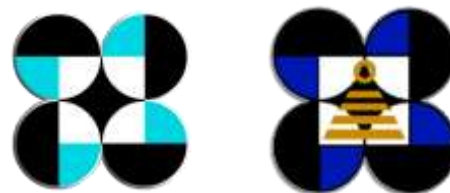
# Background

- Reasons for the unsatisfactory achievement of Filipino students
  - lack of qualified science and mathematics teachers and their beliefs about teaching the subjects
  - the science and mathematics curriculum
  - large classes resulting to overcrowded classroom
  - limited or lack of school resources like basic equipment, science laboratory, textbooks, enhancement or supplementary materials and student opportunities for learning among others



# The DOST-SEI Initiatives

- The Mobile Information Technology Classroom (MITC)
- E-Training for Science and Mathematics Teachers
- Development of Computer Aided Instructions for Science and Mathematics





# The DOST-SEI Initiatives

## The Mobile Information Technology Classroom (MITC)

- Started rolling in 2000
- A specially designed 32-seater air-conditioned bus loaded with ICT facilities that include: 17 laptop computers, LCD projector, television, VHS player, public address system and science and mathematics lessons in VHS and CD-ROMs



# The DOST-SEI Initiatives

## The Mobile Information Technology Classroom (MITC)

- Targeted to minimize the digital divide
- It is managed by science and mathematics teachers who have been trained to use its facilities and integrate the learning materials of MITC into the school curriculum.





# The DOST-SEI Initiatives

## The Mobile Information Technology Classroom (MITC)

- Served 9 regions from Luzon, Visayas and Mindanao and to date had benefited more than 300,000 students in more than 5,000 schools.
- Currently 4 MITC buses are deployed in Camarines Sur, Cebu, Siargao, and Davao regions





# The DOST-SEI Initiatives

## E-Training for Science and Mathematics Teachers

- A 10-month online training designed to upgrade the competence and confidence of public science and mathematics teachers who are non-major but are actually teaching these subjects in the elementary and secondary levels through the effective use of ICT.



• Number of teachers trained:

- 2006 - 415
- 2008 - 401



# The DOST-SEI Initiatives

## E-Training for Science and Mathematics Teachers

- Thirteen (13) selected Teacher Education Institutions (TEIs) served as the nationwide training venues where participants held and took their orientation and final examinations
- Faculties from the TEIs specializing in science and mathematics education served as the participants' online trainers



# The DOST-SEI Initiatives

## E-Training for Science and Mathematics Teachers

- The UP Open University (UPOU) conducted the training of trainers for VClass as well as the conduct of the monitoring and evaluation of the program in 2006
- University of Sto. Tomas (UST) – Education Technology Center provided the training and hosting for the Blackboard LMS in 2008.

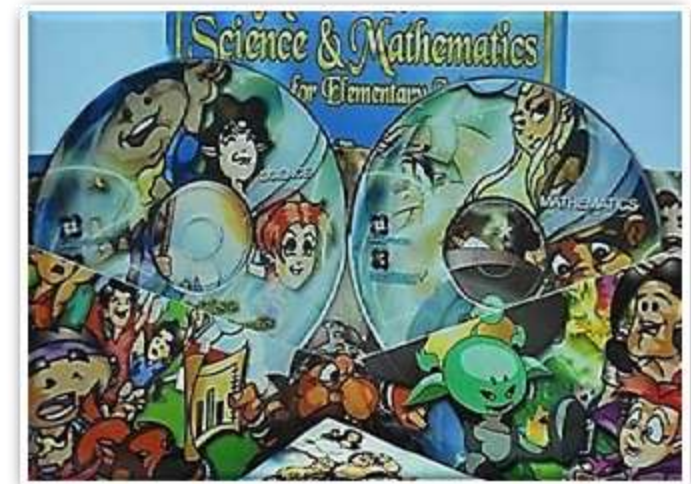




# The DOST-SEI Initiatives

## Development of Computer-Aided Instructions (CAI) for Science and Mathematics

- In 2004, the Science Education Institute (SEI) collaborated with the Advanced Science and Technology Institute (ASTI) also an agency of the DOST and a frontrunner in ICT, and produced one hundred one (101) interactive multimedia modules for elementary schools : 51 science and 60 mathematics





# The Focus of this Presentation

## Development of Computer-Aided Instructions for Science and Mathematics

### Interactive Courseware in Elementary Science and Mathematics



# Interactive Courseware in Elementary Science and Mathematics

- This courseware project on science and mathematics for elementary schools gained an overwhelming response from its stakeholders since its launching in November 2006
- Prompted the SEI to replicate ten thousand (10,000) copies of the package in December 2007 to accommodate requests



# Interactive Courseware in Elementary Science and Mathematics

- Aims to optimize, streamline and standardize educational lesson presentation in Science and Mathematics through the use of cost-effective and high quality solutions
- Assist in developing competitive elementary students who can maximize and enhance learning through the use of ICT
- Equip teachers with supplemental tools to assist them not only in teaching but also in motivating their students to learn and participate in class discussions.



# Interactive Courseware in Elementary Science and Mathematics

- Developed using Macromedia Flash (then), Adobe Photoshop and other open source applications like the GNU Image Manipulation Program (GIMP)
- Features original copyrighted local Filipino characters or representations and situations to establish branding for DOST's initiative
- Packaged in CD-ROM and uploaded in the courseware website





# Problems/Barriers

## Cost of replication

- To date about 8,000 copies of the courseware were distributed for free to various recipients including elementary schools, public offices, some foreign guests, science centers, non-government organizations and lawmakers.
- The cost of replication to provide each 38,351 public elementary school a copy is very high that which costs the government roughly around eight hundred thousand (P800,000.00) for 10,000 copies replicated in 2007.



# Problems/Barriers

## Distribution and promotion mechanism

- Acquisition of courseware is per-request and on a limited basis
- Promotional activities and materials such as participation to various exhibitions and distribution of bookmarks and flyers were seem not enough to promote the courseware, not to mention the costs for the implementation and production of such



# Problems/Barriers

**Lack of comprehensive monitoring system on courseware website users for timely feedback and evaluation of content for the continuous improvement of modules**

- In 2009, the courseware development group of SEI and ASTI developed and launched a website to serve as a repository of the modules and to enable target clients to download and practically acquire a copy of those for free anytime, anywhere. The current website however, has only limited features



# Reforms/Solutions

## The Courseware Project



The screenshot displays the Courseware Project website. The main page features the title "THE COURSEWARE PROJECT" above a stylized green tree graphic. Below this, the text reads "Learn. Explore. Have Fun. Shape Your Future with Science and Mathematics for Free!" followed by a sub-header "With a library of supplemental interactive modules designed for students, teachers and learners, knowledge is yours anytime, anywhere." A "Most Downloaded" section lists several modules with icons and brief descriptions:

- Grade 3: The Eye**: This module features simulations of the eye, its parts and functions. Similarly, graphic images of how a person sees things are presented. This module further discusses, through animations, some eye disorders and tips on how to properly take care of the eye. ISBN: 978-071-0059-01, Jul 2008. Size: 1781 KB file. # of Downloads: 11.
- Grade 3: Habitat**: This module initially presents different animals (e.g. frog, horse, lion, and monkey) in their respective habitats. Animations of organisms found in a pond, grassland, and forest are highlighted. Also emphasized are the basic needs for food and shelter of animal organisms in order to survive. ISBN: 978-071-0059-01, Jul 2008. Size: 2075 KB file. # of Downloads: 7.
- Grade 1: Associating and Identifying Numbers with Sets Having 101 to 500 Objects**: This module presents counting objects which are greater than 100 but less than 500. The lesson originates from counting beans on a shell and presents other situations which develop the same competency. ISBN: 978-071-0059-01, Jul 2008. Size: 822 KB file. # of Downloads: 7.
- Grade 3: Effects of the Sun's Heat and Light on Human Activities**: This module shows how activities of human beings are affected by the sun's heat and light. Simulations of what people usually do during sunny days are presented. In addition, harmful effects and benefits from sun's heat and light are enumerated. The module ends with simulations of things to do to prevent overexposure to sunlight. ISBN: 978-071-0059-01, Jul 2008. Size: 7548 KB file. # of Downloads: 6.
- Grade 1: Recognizing One-Fourth of a Whole**: This module facilitates recognizing one-fourth of a whole. The discussion evolves on dividing a pizza into four equal parts and distributing each part to four persons. The exercises at the end aims to enhance the concept developed. ISBN: 978-071-0059-01, Jul 2008. Size: 1030 KB file. # of Downloads: 3.

On the right side of the page, there is a "Minimum Computer Requirements" section with a download icon and the following specifications:

- Platform/OS: Linux, Mac or Windows
- Processor: 600 Mhz Intel Pentium III or equivalent
- RAM: 128 MB (256 recommended)
- Hard disk: 347 MB available disk space
- Sound: Soundcard & speaker





# Reforms/Solutions

## The Courseware Project

- An enhancement of the existing courseware website with the following added new major features:
  - Registration and Download access
  - Reports Generation
  - Feedback Gathering
  - User Administration
  - Module Administration
  - Search Mechanism
  - User Tracking and Website Traffic Monitoring Mechanism



# The Courseware Project

## User Registration and Download Access



The screenshot shows a web browser window displaying the 'The Courseware Project' website. The address bar shows the URL '202.90.141.25/courseware/index.php?page=browse'. The website has a green header with the project name and a search bar. Below the header, there are navigation options: 'All Modules', 'Browse by Subject', 'Browse by Grade', and 'Browse by Subject and Grade'. The main content area is titled 'All Modules' and lists several science modules, each with a snowflake icon and a brief description. The modules listed are: 'Grade 3: Effects of the Sun's Heat and Light on Human Activities', 'Grade 3: Habitat', 'Grade 3: Leaves', 'Grade 3: Propagating Plants', and 'Grade 3: Soil'. To the right of the main content, there is a large illustration of a tree with a group of cartoon characters sitting under it. Below the illustration is a 'Register Now' button. Further down, there is a 'Minimum Computer Requirements' section with a 'DOWNLOAD' button and a list of system requirements: Platform/OS: Linux, Mac or Windows; Processor: 600 Mhz Intel Pentium III or equivalent; RAM: 128 MB (256 recommended); Hard disk: 347 MB available disk space. The browser's taskbar at the bottom shows several open applications, including 'ICODEL concurrent p...zip' and 'Dropbox 1.152.exe'.



# The Courseware Project

## User Registration and Download Access



The screenshot shows a web browser window displaying the registration page for 'The Courseware Project'. The browser's address bar shows the URL '202.90.141.25/courseware/index.php?page=register'. The page features a green header with the project logo and name. Below the header is a search bar and a 'Log in' link. The main content area is divided into two columns. The left column contains a 'Courseware Registration' form with the following fields: 'Visitor Type' (dropdown menu set to 'Student'), 'Name' (text box with 'Tash Feliciano'), 'Age' (text box with '6'), 'Gender' (dropdown menu set to 'Female'), 'Email Address' (text box with 'atashalonaine@yahoo.com'), 'Username' (text box with 'atasha'), 'Password' (text box with '\*\*\*\*\*'), 'Country' (dropdown menu set to 'Philippines'), 'Province' (text box with 'Rizal'), 'City/Municipality' (text box with 'Morong'), 'School Name' (text box with 'URS-Morong'), 'School Type' (dropdown menu set to 'Public'), and 'Grade' (dropdown menu set to '1'). At the bottom of the form are 'Register' and 'Clear' buttons. The right column features a cartoon illustration of a group of diverse characters standing under a large tree with yellow fruit. Below the illustration is a 'Log in' button. Underneath is a section titled 'Minimum Computer Requirements' with a 'DOWNLOAD' button and a list of system specifications: Platform/OS: Linux, Mac or Windows; Processor: 600 Mhz Intel Pentium III or equivalent; RAM: 128 MB (256 recommended); Hard disk: 347 MB available disk space; Sound: Soundcard & speaker.

Courseware Registration

\*Visitor Type: Student

Name: Tash Feliciano

\*Age: 6

\*Gender: Female

\*Email Address: atashalonaine@yahoo.com

\*Username: atasha

\*Password: \*\*\*\*\*

\*Country: Philippines

\*Province: Rizal

\*City/Municipality: Morong

\*School Name: URS-Morong

\*School Type: Public

\*Grade: 1

Register Clear

Log in

Minimum Computer Requirements

DOWNLOAD


Platform/OS: Linux, Mac or Windows  
Processor: 600 Mhz Intel Pentium III or equivalent  
RAM: 128 MB (256 recommended)  
Hard disk: 347 MB available disk space  
Sound: Soundcard & speaker



# The Courseware Project

## User Registration and Download Access

← → 202.90.141.25/courseware/index.php?page=viewdetail&id=11

 The Courseware Project

Science - Grade 3: The Eye

This module features simulations of the eye, its parts and functions. Similarly, graphic images of how a person sees things are presented. This module further discusses, through animations, some eye disorders and tips on how to properly take care of the eye

ISBN 978-971-8636-31, Jul 2008  
Size 1761 KB  
No. of Downloads 12

[Download]

**louie** Posted 9:23 pm February 21, 2012  
I highly recommend this module. Easy to understand.

**Louie Mandapat** Posted 9:24 pm February 21, 2012  
I rate this 4/5

Enter your comment

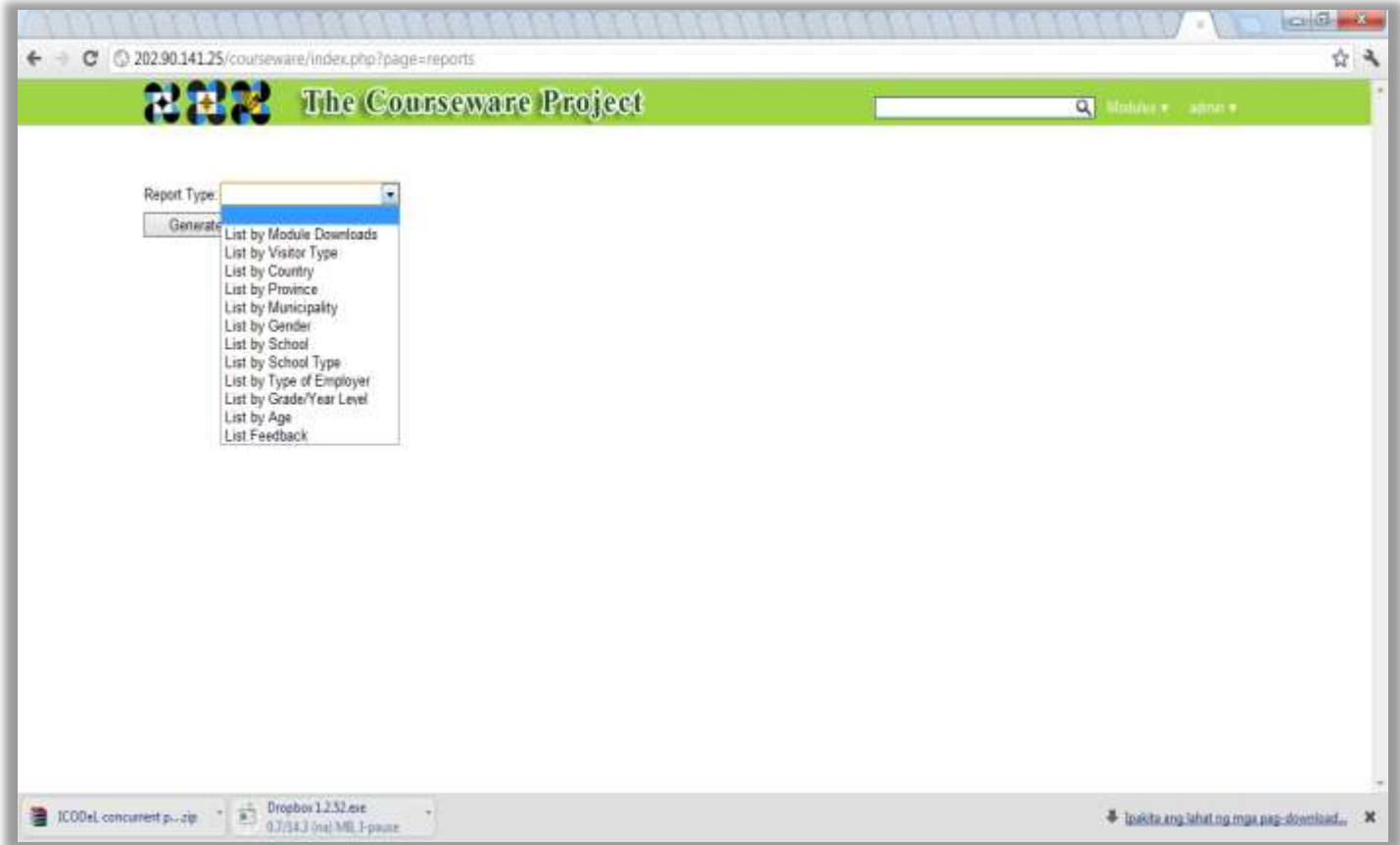
Submit





# The Courseware Project

## Reports Generation



# The Courseware Project

## Reports Generation



The screenshot displays a web browser window with the URL `202.90.141.25/courseware/index.php?page=reports`. The page header features the logo for 'The Courseware Project' and the text 'MODULES IN SCIENCE AND MATHEMATICS FOR ELEMENTARY SCHOOL' by Science Education Institute. A sidebar on the left allows for filtering reports by type and module. The main content area, titled 'List by Downloads', contains a table with the following data:

Grade	Title	Downloads
1	Associating and Identifying Numbers with Sets having 101 to 500 Objects	5
1	Place Value of 3-Digit Numbers	1
1	Recognizing One-Fourth of a Whole	3
2	Classifying Shapes According to the Number of Sides	1
2	Comparing Unit Fractions Using Relation Symbols	2
2	Measuring Using Standard Units of Linear Measure	0
3	Area of Square and Rectangle	1
3	Converting Time Measure from Larger to Smaller Units and Vice Versa ISBN 978-971-8600-31-3, July 2006	0
3	Effects of the Sun's Heat and Light on Human Activities	6
3	Habitat	7
3	Leaves	1
3	Multiplying 2 Digit to 4 Digit Numbers by 1 Digit to 2 Digit Numbers with Regrouping	1
3	Propagating Plants	1
3	Soil	0
3	Special Properties of Solids	0

The browser's taskbar at the bottom shows several open applications, including 'ICODEL concurrent p...-zip', 'Dropbox 1.2.52.exe', and a download of 'ipatita.ang.lahaEng.mga.pag-downloa...'.



# The Courseware Project

## Feedback Gathering



202.90.141.25/courseware/index.php?page=viewfeedback

**The Courseware Project**

Member Feedbacks

NAME	SUBJECT	DATE SENT	ACTION
Atasha Lorraine G. Feliciano	Habitat	October 13, 2011, 10:39 am	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Louie Mandapat	test subject		<a href="#">VIEW</a>   <a href="#">DELETE</a>

Total - 2

ICODEL.coment p... zip    Dropbox 1.2.52.exe 0.7/0.43 (mb) MB, 3-pause    ipatita.org/whatsng.mga.pag-download...



# The Courseware Project

## User (Registered) Administration



202.90.141.25/courseware/index.php?page=memberaccounts

**The Courseware Project**

Type	Name	Email	Age	Gender	Action
Student	Louie Mandapat	louiechinto12@yahoo.com	25	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
undefined	Jaderick Pabico	jaderickpabico@yahoo.com	39	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Student	George Monroyo	george.monroyo@gmail.com	27	F	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Professional	Dave Regoso	dave@yahoo.com	29	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Parent	Francis Atual	francis@yahoo.com	28	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Professional	Josh%20Feliciano	joshfeliciano@gmail.com	30	F	<a href="#">VIEW</a>   <a href="#">DELETE</a>
undefined	Atasha Lorraine G. Feliciano	atashalorraine@yahoo.com	6	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Others	Cotnie	clikhan@uplb.edu.ph	40	F	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Professional	mar costales	mar@yahoo.com	50	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>
Student	James Luis G. Feliciano	jamesluisfeliciano@yahoo.com	8	M	<a href="#">VIEW</a>   <a href="#">DELETE</a>

Total : 10

ICODeL concurrent p...zip    Dropbox 1.232.exe 0.7/34.3 (na) ML1-paust    ipakita.org/ihat.ng.mga.pag-download...





# The Courseware Project

## Site Administrators

202.90.141.25/courseware/index.php?page=accounts

**The Courseware Project**

Modules | admin

### Manage Accounts

Username:

Password:

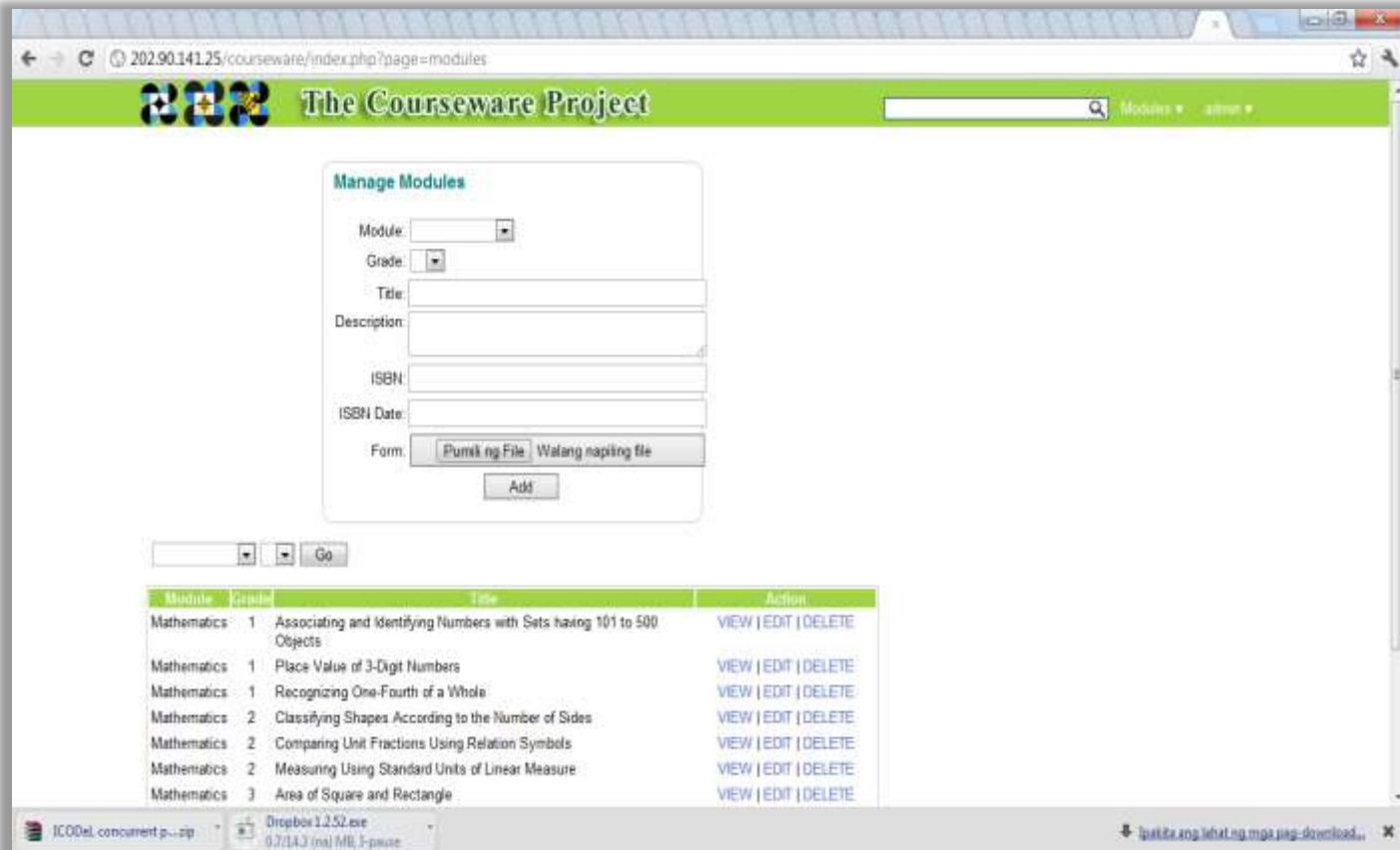
Username	Action
louie	EDIT   DELETE
admin	EDIT   DELETE
ampy	EDIT   DELETE
Mia	EDIT   DELETE
sheryl4lejos	EDIT   DELETE
josh	EDIT   DELETE

ICODEL concurrent p...zip | Dropbox 1.2.52.exe 0.7(1A.7) (na) MB, F-pause | ipakita.org/what.ng.mga.jpg-download...



# The Courseware Project

## Module Administration



The screenshot shows a web browser window displaying the 'The Courseware Project' interface. The address bar shows the URL: 202.90.141.25/courseware/index.php?page=modules. The page features a green header with the project logo and title. Below the header is a search bar and a navigation menu with 'Modules' and 'Admin' options. The main content area is titled 'Manage Modules' and contains a form for adding or editing modules. The form includes fields for 'Module', 'Grade', 'Title', 'Description', 'ISBN', and 'ISBN Date'. There are two buttons for file uploads: 'Pumak ng File' and 'Walang napiling file', and an 'Add' button. Below the form is a search bar with a 'Go' button. A table lists the existing modules with columns for 'Module', 'Grade', 'Title', and 'Action'. The table contains seven rows of data, each with a 'VIEW | EDIT | DELETE' link in the 'Action' column. The browser's taskbar at the bottom shows several open applications, including 'ICODEL concurrent p...zip', 'Dropbox 1.2.52.exe', and 'ipakita.org/lehat.ng.mga.pag-download...'. The taskbar also shows the system clock and other icons.

**Manage Modules**

Module:

Grade:

Title:

Description:

ISBN:

ISBN Date:

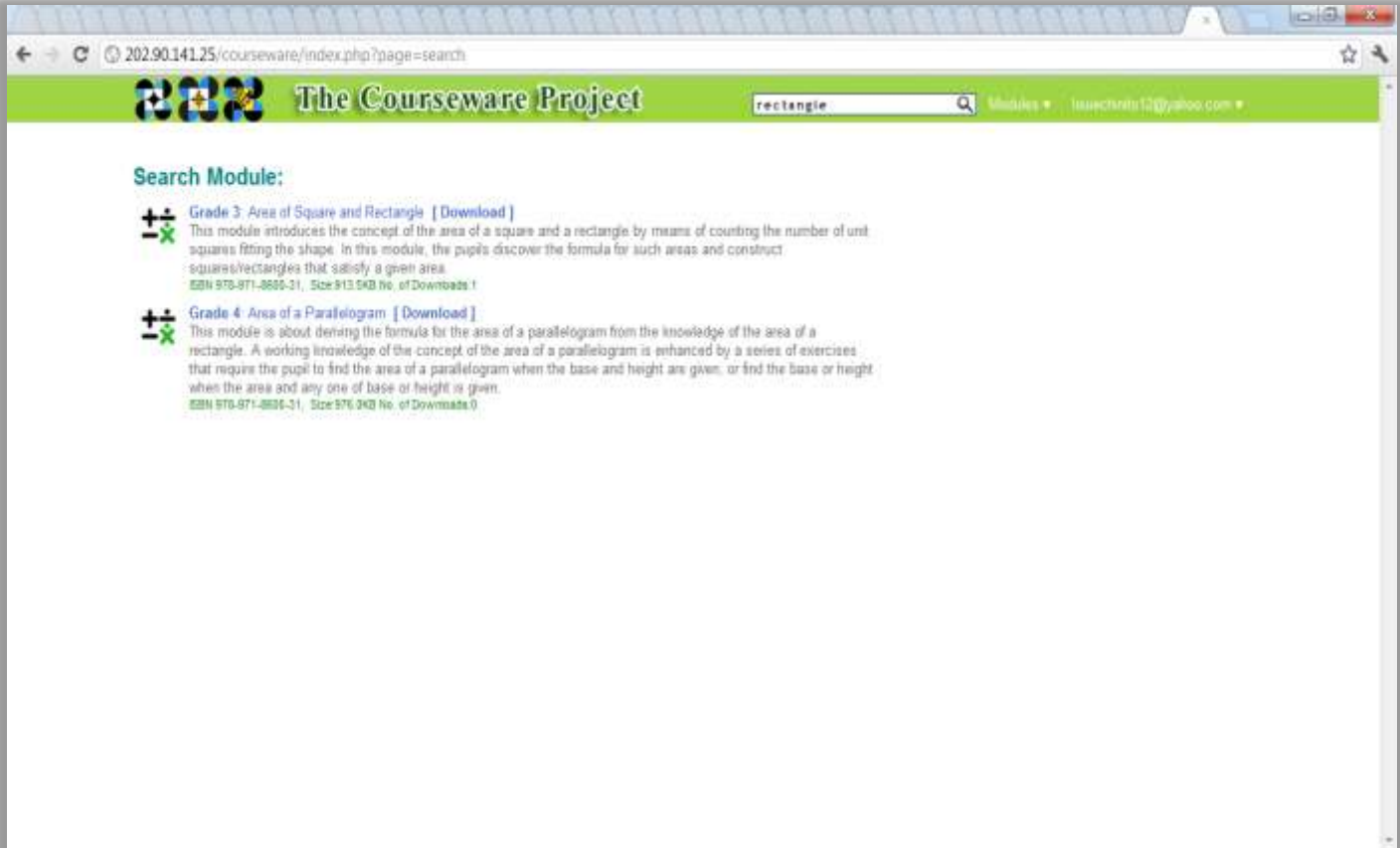
Form:

Module	Grade	Title	Action
Mathematics	1	Associating and Identifying Numbers with Sets having 101 to 500 Objects	VIEW   EDIT   DELETE
Mathematics	1	Place Value of 3-Digit Numbers	VIEW   EDIT   DELETE
Mathematics	1	Recognizing One-Fourth of a Whole	VIEW   EDIT   DELETE
Mathematics	2	Classifying Shapes According to the Number of Sides	VIEW   EDIT   DELETE
Mathematics	2	Comparing Unit Fractions Using Relation Symbols	VIEW   EDIT   DELETE
Mathematics	2	Measuring Using Standard Units of Linear Measure	VIEW   EDIT   DELETE
Mathematics	3	Area of Square and Rectangle	VIEW   EDIT   DELETE



# The Courseware Project

## Search Mechanism



The screenshot shows a web browser window with the address bar displaying `202.90.141.25/courseware/index.php?page=search`. The page header features the logo for 'The Courseware Project' and a search bar containing the text 'rectangle'. Below the header, the search results are displayed under the heading 'Search Module:'. Two results are listed:

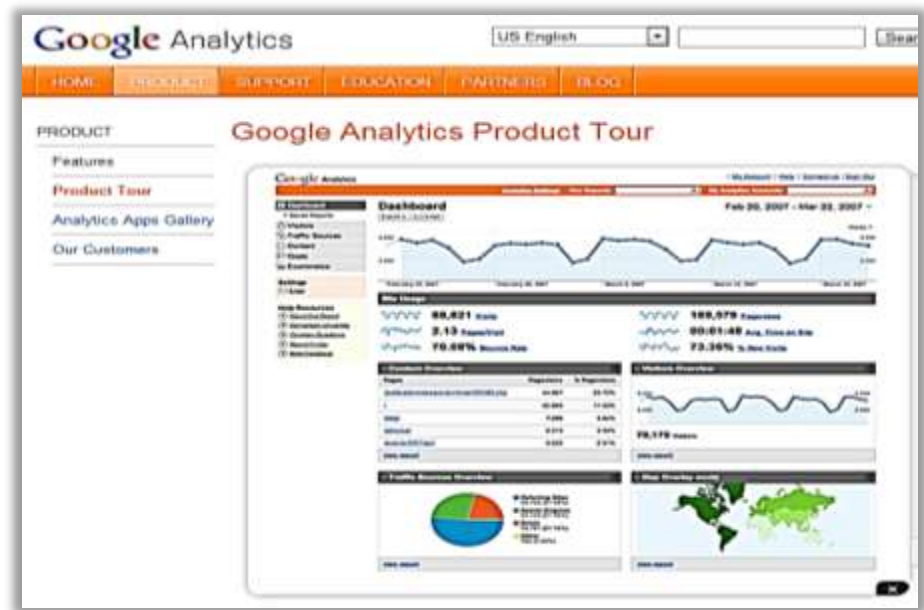
- Grade 3: Area of Square and Rectangle [ Download ]**  
This module introduces the concept of the area of a square and a rectangle by means of counting the number of unit squares fitting the shape. In this module, the pupils discover the formula for such areas and construct squares/rectangles that satisfy a given area.  
ISBN 978-971-8600-21, Size 913.5KB No. of Downloads: 1
- Grade 4: Area of a Parallelogram [ Download ]**  
This module is about deriving the formula for the area of a parallelogram from the knowledge of the area of a rectangle. A working knowledge of the concept of the area of a parallelogram is enhanced by a series of exercises that require the pupil to find the area of a parallelogram when the base and height are given, or find the base or height when the area and any one of base or height is given.  
ISBN 978-971-8606-21, Size 976.2KB No. of Downloads: 0



# The Courseware Project

## User Tracking and Website Traffic Monitoring Mechanism

- Aside from the registration mechanism, the site will also use the Google Analytics (GA) to efficiently track information not captured in the registration





# Upcoming/Future Plans

## Courseware Re-Assembled

- Courseware bundle downloading is the grouping or bundling of several files into a single self-extractable file that can be downloaded and saved. Some several self-extracting file programs for Windows are WinRAR, WinZip, the builtin IExpress, and the open source software 7Zip are available.



# Upcoming/Future Plans

## Courseware Mobile Application (CMAApp)

- The courseware app shall lead the user to the courseware website and will have the option to either view (run) or download the modules for storage or sharing (Bluetooth).
- Learning science and math is not only fun, it is also made easy, portable and most of all it is ubiquitous



# Upcoming/Future Plans

## Courseware Reloaded (on Social Networking Site)

- A Courseware Facebook page will serve as an alternate site to view the modules and as means to promote the courseware website as well



# Current Status/Recommendations

- The Courseware Project final version once approved and adapted will host the 101 modules in elementary science (Grades 3 to 6) and mathematics (Grades 1 to 6).
- Eventually, modules from first to fourth year of secondary level (high school) will also be uploaded to the site along with other modules currently being digitized by the Advanced Science and Technology Institute (ASTI).



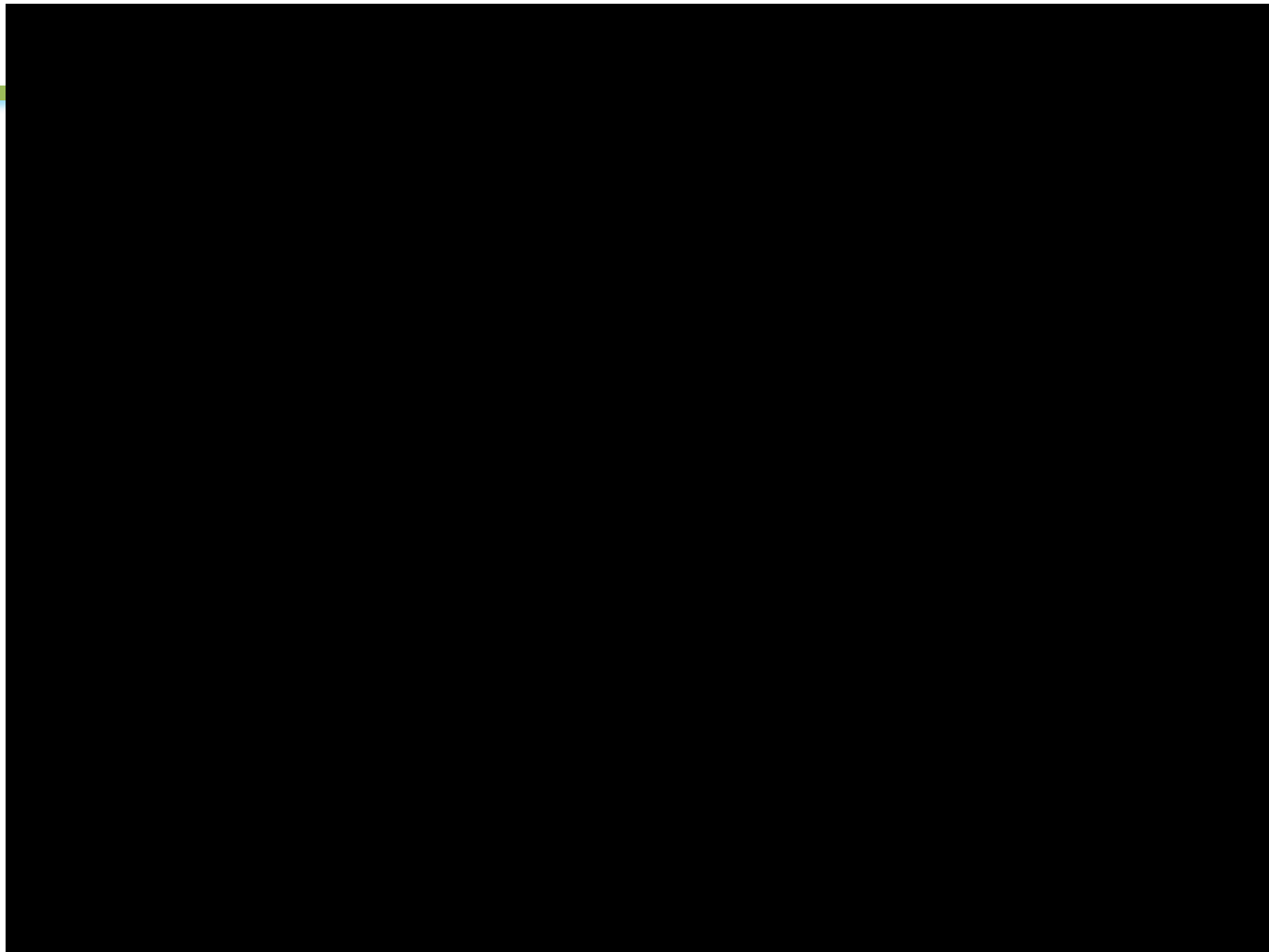


# Current Status/Recommendations

- An assessment or study on the impact, usefulness, effectiveness and efficiency of the overall functionality of the modules will be conducted this year







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# Mabuhay and Thank You Very Much!

dost.gov.ph

sei.dost.gov.ph

asti.gov.ph

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