The CVIF Dynamic Learning Program: Achieving Performance Targets with Strategic and Efficient Learning

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In Jagna, Bohol, Philippines
The original CVIF strategic plan (circa 1999)

• Focus on outcomes indexed by real numbers: UPCAT passers, national exams and, if possible, international behavioral standards and assessments.

• Leapfrog with increased math proficiency, then do broadfront with language and science.
Early roadblocks

- Poor facilities
- Lack of qualified teachers
- Lack of funds
- Prevailing lack of sense of urgency nor need for change
- Low self-esteem and belief in achieving higher goals in life
Strategic Perspective: The CVIF as a Microcosm and Prototype
- Global Trends and Issues Impacting Philippine Education
- CVIF-DLP’s Response
- Insights from Pedagogy, Cognitive Psychology and Neurosciences
Global Trends #1
Emerging lack of Science, Technology, Engineering, Math (STEM) Teachers

On-going aggressive recruitment of science and math teachers to the US, Canada, Australia, New Zealand, etc., even from countries like the Philippines which already has a severe shortage of qualified teachers.
Global Trends #1
Emerging lack of Science, Technology, Engineering, Math (STEM) Teachers

- The US needing for the next decade 1 million more STEM graduates than what they could produce at the present rate.
- Western Europe experiencing a decline in students going into STEM.
Common problem in poor countries
CVIF-DLP’s Response: A Systems Approach to Process-induced Learning

- For schools which lack qualified teachers: bypass the lack of teachers.
- For schools with good teachers: redefine the role of teachers.
CVIF-DLP Conceptual Framework

Focus of Learning Program

- Improving learner disposition
- Narrowing gap between required and desired, intended and implemented curricula
Features of process-induced learning

Common Practice

Learner Activity

Lecture and Class Discussion (70-80%)

Learners’ Independent Activity (70-80%)

Lecture Discussion

CVIF Program
For all subjects, there is no introductory lecture before students do the learning activities (questions, problems, etc.).

Lectures and class discussion are done only about $\frac{1}{4}$ of the time (the rest being allotted for written activities).
In the CVIF-DLP:

- Students learn how to work independently without close supervision (about 70% of the time the subject teacher is outside of the classroom).
- Students become responsible for their own learning.
- Students become more confident and able to investigate problems and find solutions.
- Students become resilient in the face of difficulties.
Parallel Classes Scheme

Strategic Study-Rest Periods

Daily Protocol for Accomplishing of DLP Activity Sheets

In-school Comprehensive Learner Portfolio

Improving Learner Disposition

Integrated Spiritual and Cultural Formation
Parallel Learning Groups (Simultaneous Classes)

Section 1 Facilitator

Section 2 Facilitator

Section 3 Facilitator

Expert Teacher
# Class Program with Parallel Classes

<table>
<thead>
<tr>
<th>Time</th>
<th>Mins</th>
<th>First Year (3 sections)</th>
<th>Second Year (3 sections)</th>
<th>Third Year (3 sections)</th>
<th>Fourth Year (3 sections)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30-7:40</td>
<td>10</td>
<td><em>Morning Prayers and Flag Ceremony</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:40-9:10</td>
<td>90</td>
<td><em>Science</em></td>
<td><em>Math / Computer Science</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:10-9:30</td>
<td>20</td>
<td><em>Recess</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30-11:00</td>
<td>90</td>
<td><em>Math / Computer Science</em></td>
<td><em>Science</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00-12:00</td>
<td>60</td>
<td><em>Technology and Livelihood Education / Language Laboratory (once a week)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00-1:30</td>
<td>90</td>
<td><em>Lunch Break</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:30-2:30</td>
<td>60</td>
<td><em>Language Studies (English or Filipino)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:30-3:30</td>
<td>60</td>
<td><em>Language Studies (English or Filipino)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30-5:00</td>
<td>90</td>
<td><em>Social Studies and Values Education</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Insights from Neurosciences

- brain activation of different structural parts to achieve or accomplish a task;
- compensation for deficits or weakness of certain brain regions;
- parts of the brain can perform multiple functions

[See e.g., R. J. Sternberg, Cognitive Psychology; S. Gilman and S. W. Newman, Manter and Gatz’s Essentials of Neuroanatomy and Neurophysiology; OECD 2002]
Insights from Neurosciences

A Looking at words

B Listening to words

C Speaking words

D Thinking of words

• Principles of Neural Science (4th Edition)
  Editors: Eric R. Kandel, James H. Schwartz and Thomas M. Jessell
Distinction between learners being “behaviorally dynamic” or “cognitively dynamic”

Global Trends #2:

- More advanced topics
- Faster pace of lessons
CVIF-DLP’s Response: Development of a good learning ethos over content coverage.

- Writing slows the students down allowing more time for the brain to absorb a topic.

- Writing and drawing of figures activate both the psychomotor and visual faculties.
FOCUS: Enhanced by an Activity-based Multi-domain Learning

- Learning by doing
- Discovery approach
- Problem-solving
- Active, not passive, learning
- In-school activity policy
“Neurons that fire together are wired together.”
“Neurons that fire out of sync, lose their link.”

- D. Hebb

CVIF DLP: Writing the Activities activates both the psychomotor and visual faculties of the brain.
**ACTIVITY SHEET**

Name: __________________

Grade/Score: ____________

Year and Section: _____________________________

Date: __________________

Please check the appropriate box.

<table>
<thead>
<tr>
<th>Subject</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion/Values Ed.</td>
<td></td>
</tr>
<tr>
<td>General Science</td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
</tr>
<tr>
<td>Filipino</td>
<td></td>
</tr>
<tr>
<td>Araling Panlipunan</td>
<td></td>
</tr>
<tr>
<td>TLE / IT</td>
<td></td>
</tr>
<tr>
<td>MAPEH</td>
<td></td>
</tr>
<tr>
<td>MAPEH</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept Notes</td>
<td></td>
</tr>
<tr>
<td>Laboratory Report</td>
<td></td>
</tr>
<tr>
<td>Formal Theme</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Skills / Exercise / Drill</td>
<td></td>
</tr>
<tr>
<td>Drawing / Art</td>
<td></td>
</tr>
<tr>
<td>Informal Theme</td>
<td></td>
</tr>
</tbody>
</table>

Activity Title: _______________

Learning Targets: ________________________________

Reference: Title ____________________________

Author ____________________________

Page Numbers _______
Designing Learning Activities

- Concept Notes (Introductory Material)
- Example/illustration
- Questions
- Problems
- Exercises
Brain imaging has revealed that both brain volume and myelination (a maturing process of neural connections) continue to grow throughout adolescence and during the young adulthood period. (OECD, 2002)

Note that a myelinated axon has greater conduction velocity of signals.
The neuron

dendrites
nucleus
perikaryon
nucleolus
axon
myelin sheath
Afferent
Efferent
[Adapted from Manter and Gatz’s Essentials of Clinical Neuroanatomy and Neurophysiology, 9th ed; and Wheater’s Functional Histology, 3rd ed.]
CVIF-DLP’s Response:
Every academic day in the CVIF-DLP is geared towards developing stamina and discipline.

**STAMINA and DISCIPLINE:**

*These are developed by the routine of learning activities. At the end of the school year each student has written over 200 pages of concept notes, drills, exercises, illustrations, etc, for each subject.*
Instead of notebooks, the Comprehensive Student Portfolio

- Compilation of all activities, exams, quizzes, concept notes
- Color-coded for subject areas
- Cumulative scholarship (typical of scientists’ works)
- In-school Portfolio Policy
### Fourth year students, Section-A (Honors)

**48 students**  
SY 2011-2012

<table>
<thead>
<tr>
<th>Subject</th>
<th>Science</th>
<th>Math</th>
<th>Eng</th>
<th>Fil</th>
<th>Makabayan</th>
<th>Total no. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>878</td>
<td>843</td>
<td>786</td>
<td>842</td>
<td>1541</td>
<td>4890</td>
</tr>
</tbody>
</table>
Global Trends # 3
Information now readily accessible (internet, cell phones, etc.) to a new generation of learners whose brains are wired differently.
CVIF-DLP’s Response: Enable the students to become independent learners.

The CVIF-DLP develops in the students the following habits of the mind:

- To analyze new and unfamiliar materials;
- To be critical of new available data;
- To synthesize various topics mastered;
- To solve problems and create new pathways.
Global Trends # 4: Tutoring after school (cram school) or has become a billion dollar industry.
CVIF-DLP’s Response: Enhancing creativity and originality through strategic study and rest periods.

- PEHM Days (Wednesdays: no academic classes)
- No-homework policy
No homework: Why?

- To enjoy wholesome leisure
- More relaxing family time
- Sleep early (by 8 or 9 p.m.) so they can be fresh and energized for the next day’s schoolwork.
- Health experts say that young persons need eight hours of sleep and an additional one-fourth hour for every year of age under 18 years old.
Advise from Health Experts:

<table>
<thead>
<tr>
<th>Age</th>
<th>Sleep Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborns (0-2 months)</td>
<td>12-18 hours</td>
</tr>
<tr>
<td>Infants (3 to 11 months)</td>
<td>14 to 15 hours</td>
</tr>
<tr>
<td>Toddlers (1-3 years)</td>
<td>12 to 14 hours</td>
</tr>
<tr>
<td>Preschoolers (3-5 years)</td>
<td>11 to 13 hours</td>
</tr>
<tr>
<td>School-age children (5-10 years)</td>
<td>10 to 11 hours</td>
</tr>
<tr>
<td>Teens (10-17)</td>
<td>8.5-9.25 hours</td>
</tr>
<tr>
<td>Adults</td>
<td>7-9 hours</td>
</tr>
</tbody>
</table>

Source: National Sleep Foundation

“When memory-related neurons fire in sync with certain brain waves, the resulting image recognition and memories are stronger than if this synchronization does not occur.”
Synchronization is influenced by "theta waves" – associated with relaxation, daydreaming and drowsiness, but also with learning and memory formation.
To summarize:
The CVIF DLP Components

- Parallel Learning Groups (Modified Jigsaw Strategy)
- Daily Protocol for Learning Activities
- In-school Comprehensive Student Portfolio (instead of notebooks)
- Teachers Comprehensive Portfolio (instead of Lesson Plans)
- Strategic Study / Rest Periods
- Integrated Spiritual and Cultural Formation
Global Trends # 5
Culture of high finance, market forces, luxury and conveniences
CVIF-DLP’s Response: Functional spiritual formation

In carrying out its curricular, co-curricular and extra-curricular programs, the CVIF-DLP adopts the perspective:

*Primum Regnum Dei,*

*Motto of Ateneo de Naga University*
The CVIF Dynamic Learning Program addresses:

**Learner Disposition:** Habit-forming Daily Protocol where students are engaged.

**Large Classes:** Activities are individualized

**Lack of Qualified Teachers:** Prepared Activities done independently by students 80% of the time.
The CVIF-DLP is a package of paradoxes:

- To teach more, teach less.
- To cover more, cover less.
- To speed up, first slow down.
- To master more, study less.
New mindsets required

For Teachers:
The duty of a teacher is not to teach, but to enable students to learn.

for Students and Their Families:
Students learn “how to learn” independently.
EXAMPLE: the problem of motivation

Conventional
- Games
- Stories
- Group work
- Recitation
- Board work
- Etc.

CVIF-DLP
- Daily protocol for writing of activities on the Activity Sheet
- Habit-forming (biological)

external

internal
Performance Indicators:

Input factors:

- Jagna is a fourth class municipality
- ~ 90% of freshmen come from public elementary schools. (The CVIF has no elementary.)
- Liberal admission policy (All applicants passed the entrance exam for several years.)
- Tuition is P 8,000 per student per year.
<table>
<thead>
<tr>
<th>Overall GSA</th>
<th>NSAT 2001 No. of students</th>
<th>NCAE 2008 No. of students</th>
<th>NCAE 2009 No. of students</th>
<th>NCAE 2010 No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 - 99+</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>98</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>97</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>90 - 99 %tile</td>
<td>1 of 66 (2%)</td>
<td>21 of 110 (19%)</td>
<td>27 of 115 (23%)</td>
<td>48 of 106 (45%)</td>
</tr>
</tbody>
</table>
## Improved Performance in DepEd Nationwide Exams

<table>
<thead>
<tr>
<th>Math</th>
<th>NSAT 2001</th>
<th>NCAE 2007</th>
<th>NCAE 2009</th>
<th>NCAE 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students with %-tile 90 &amp; above</td>
<td>1 of 66 (1.5%)</td>
<td>13 of 106 (12.3%)</td>
<td>21 of 115 (18.3%)</td>
<td>54 of 106 (51%)</td>
</tr>
</tbody>
</table>

17 students scored in the 99-99+ percentile rank in the NCAE 2010
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>Verbal Ability</td>
<td>Verbal Ability</td>
<td>Verbal Ability</td>
<td>Reading Comprehension</td>
<td>Reading Comprehension</td>
<td>Reading Comprehension</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>40.2</td>
<td>52.5</td>
<td>63.9</td>
<td>73.6</td>
<td>60.3</td>
<td>69.2</td>
<td>83.1</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>38</td>
<td>49</td>
<td>66</td>
<td>79</td>
<td>63</td>
<td>75</td>
<td>88</td>
</tr>
<tr>
<td><strong>90 to 99 %-tile</strong></td>
<td>2 of 66 (3 %)</td>
<td>10 of 106 (9 %)</td>
<td>20 of 115 (17 %)</td>
<td>36 of 106 (34 %)</td>
<td>18 of 106 (17 %)</td>
<td>26 of 115 (23 %)</td>
<td>47 of 106 (44 %)</td>
</tr>
</tbody>
</table>
# Percentile Rank in NCAE 2011

*(given to Juniors)*

<table>
<thead>
<tr>
<th>Percentile Rank</th>
<th>Mathematical Ability</th>
<th>Scientific Ability</th>
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</thead>
<tbody>
<tr>
<td>99+</td>
<td>12 Students</td>
<td>7 Students</td>
</tr>
<tr>
<td>99</td>
<td>3 Students</td>
<td>4 Students</td>
</tr>
</tbody>
</table>
Performance Scores in Standardized Tests

Majority of students

Number of Students

Performance Scores in Standardized Tests

Baseline 2001

2006

2009

2010

NSAT/ NCAE
University of the Philippines College Admission Test (UPCAT)

Up to more than 10% of CVIF seniors

Number of UPCAT Passers

Year

'08

'07

'06

'05

'04

'03

'02

'01

'00

'99

'10

'11

'12

16

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

0
International Benchmarking

- SAT scores of marker student within cut-off of good American universities

- Alumna accepted in U California Berkeley, BS Computer Science
Nation-wide distribution of talents
Requirements for scaling up in education

In the shortest possible time, with only local resources (no need for loans), to have the highest possible number of students having the highest levels of mastery in the sciences, math and engineering disciplines, based on international standards.
Scaling up partners:

- Rep. Luis Villafuerte of Camarines Sur
- Governor Edgar M. Chatto of Bohol
- Smart Communications
- PLDT-Smart Foundation
- Meralco Foundation
- Diocese of Pagadian
- Claret School of Zamboanga City
- Diocese of Cabanatuan
- ARMM LGU-DepEd partnership
- DepEd-PLDT-Smart partnership for Cagayan de Oro, Negros Oriental, Sagay City, Basilan
- …
Further information: website put up by Smart Communications, Inc.

www.dlp.ph

Thank you