DISTRIBUTIONAL ANALYTICS FOR LARGE SCALE PEDAGOGICAL EFFECTIVENESS: THE CVIF DYNAMIC LEARNING PROGRAM EXPERIENCE

By

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Presented by

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New pedagogy for new global scenarios:

- **Fourth Industrial Revolution characterized by:**
  - *Artificial Intelligence, Robotics, Internet of Things, Machine Learning, Automation taking over jobs, …*
  - *Job market segregated into low-skill/low-pay and high-skill/high-pay segments.* https://www.weforum.org/agenda/2016
  - *Workers are expected to learn a new skill every 5 years (4 – 5 jobs in a lifetime)*
- **Countries with strong STEM education and training will dominate.**
- **Worldwide lack of effective STEM teachers**
- **New results from Neuroscience**
- **Web-based Learners**

The CVIF Dynamic Learning Program (DLP)

(*since 2002*)

- a systems approach to process-induced learning
- achievement of targets guided by Distributional Analytics
- incorporates 21st century skills: *Critical Thinking, Problem Solving, Collaboration, Communication*
- applied at the elementary, secondary, and tertiary levels
- CVIF is highly inclusive; solid performance is achieved for a broad spectrum of learner abilities and backgrounds

Carpio-Bernido, M. V., Bernido, C. C. , (2004) Transactions of the National Academy of Science and Technology, Philippines; (2011) CVIF Dynamic Learning Program: A Systems Approach to Process-Induced Learning. In Proc. of the epiSTEME 4 (Mumbai:HBCSE).

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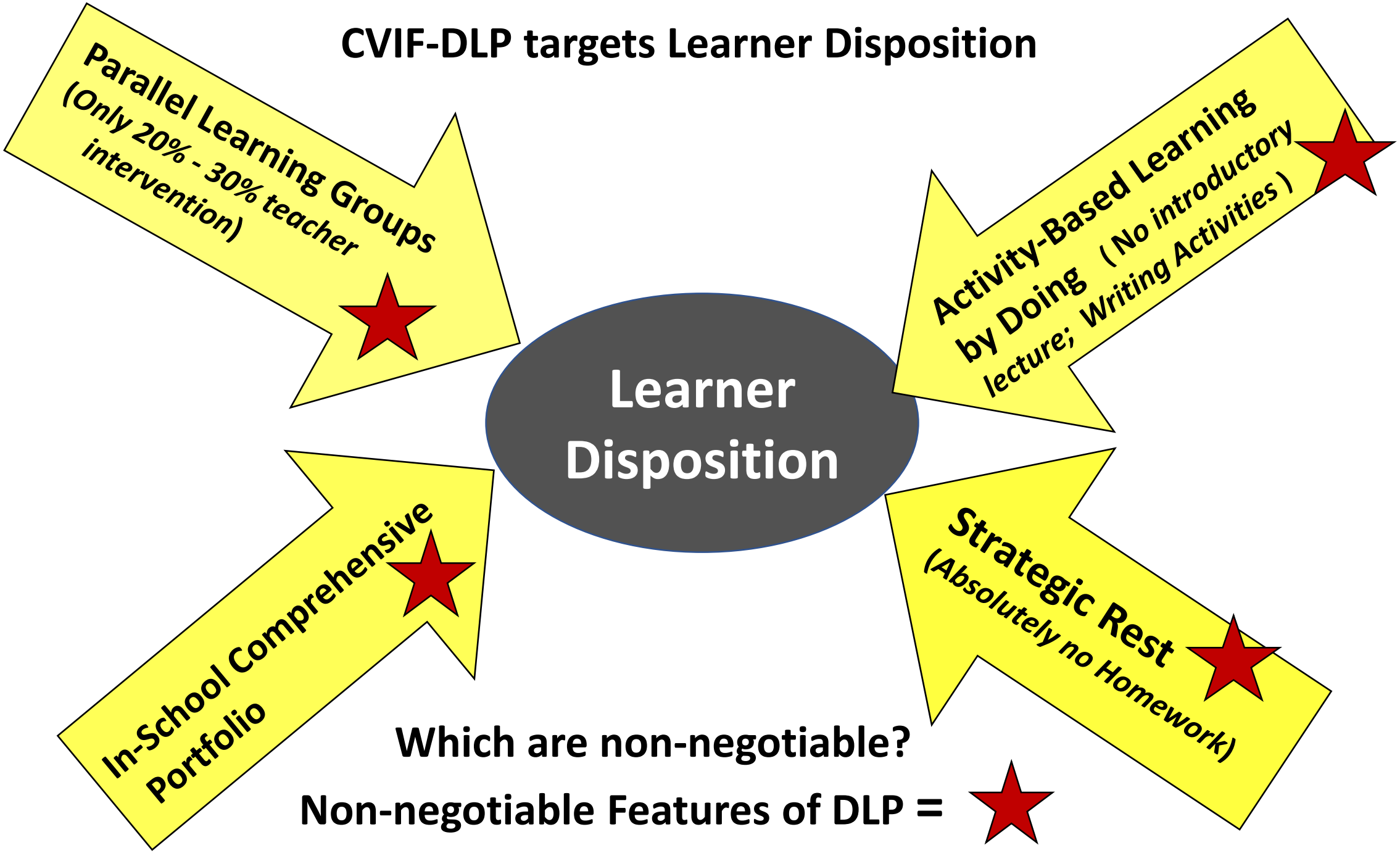
CVIF-DLP targets Learner Disposition

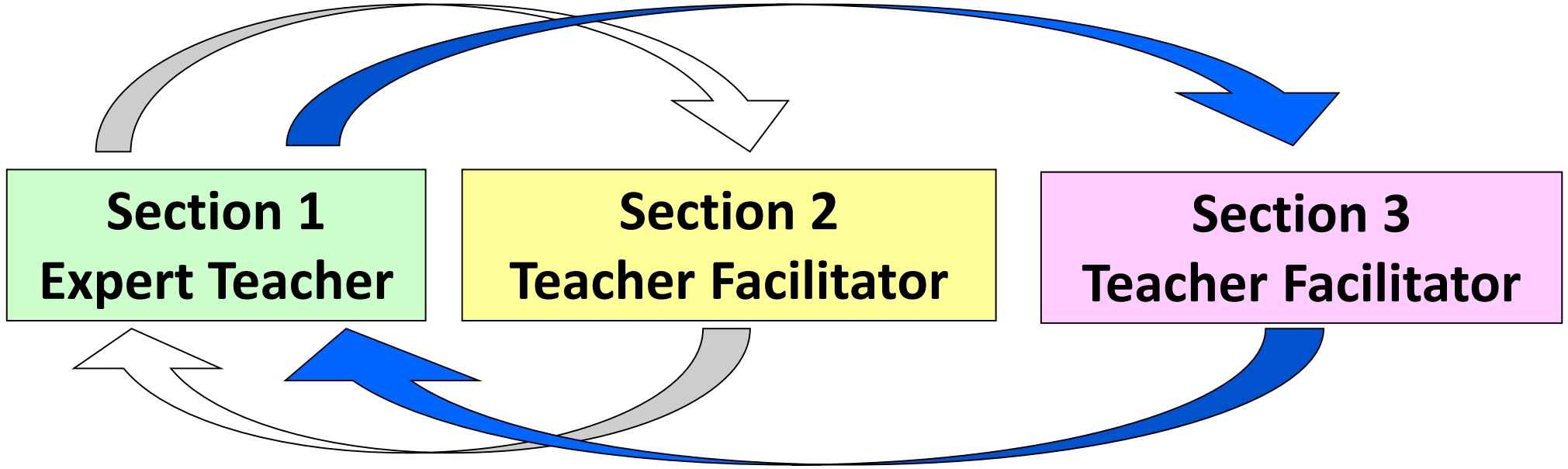


Which are non-negotiable?

Non-negotiable Features of DLP =

Parallel Classes Schedule: Mindset for Independent Learning

Students explore on their own. Parallel Classes **limit teacher intervention** to only 20 % to 30 % of the period.



Parallel Classes

STUDENTS EXPLORE INDEPENDENTLY: Activity-Based Learning

For all subjects, there is *no introductory Lecture.*

Develops CRITICAL THINKING & PROBLEM SOLVING ABILITIES

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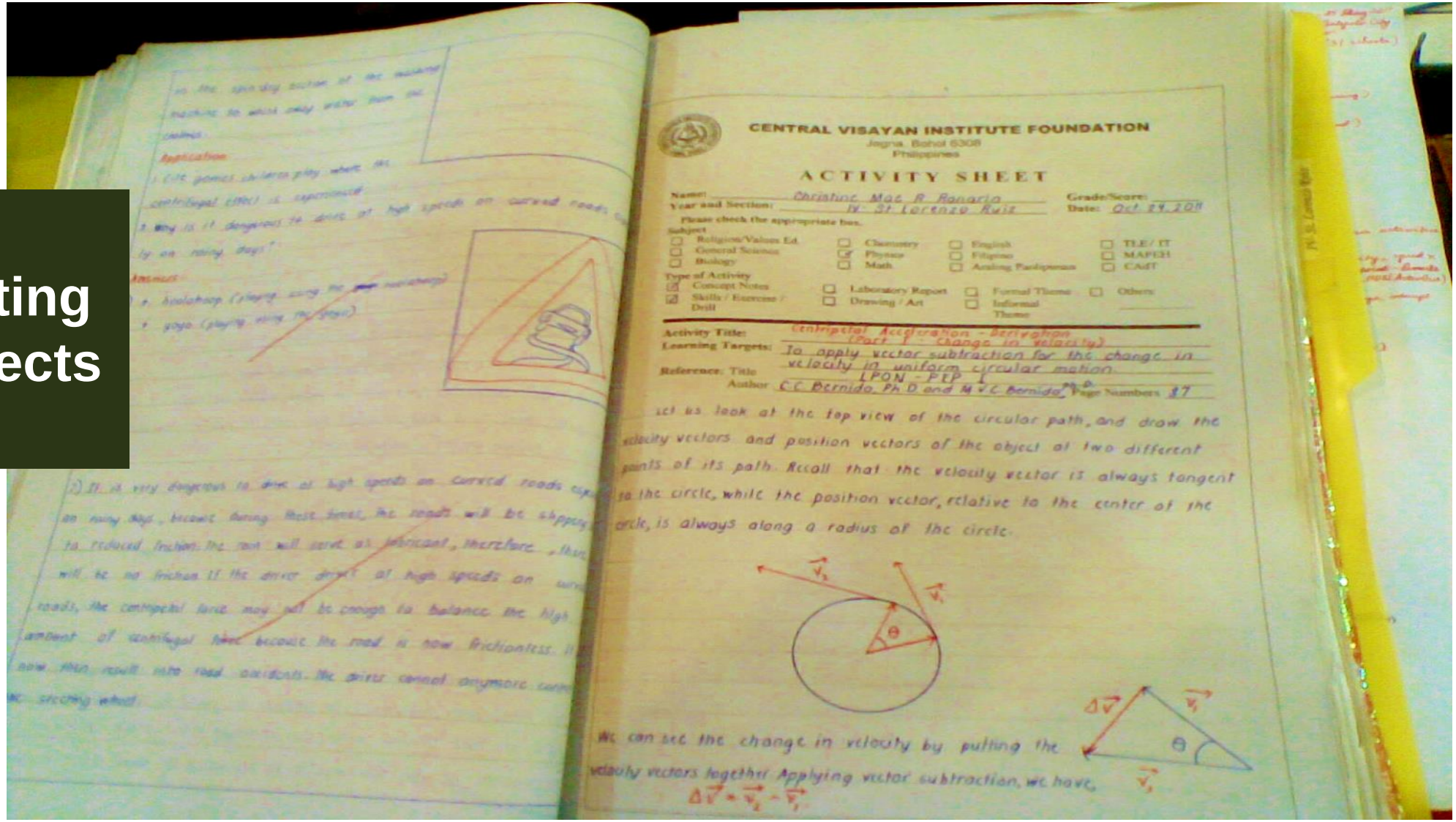
Daily exposure to Communicating technical subjects concisely !



CENTRAL VISAYAN INSTITUTE FOUNDATION
Jagna, Bohol 6308
Philippines

ACTIVITY SHEET

Name: Christine Mae R. Ronario
Year and Section: IX- St Lorenzo Ruiz
Grade/Score:
Date: Oct 29, 2019

Please check the appropriate box.

Subject: ☐ Religion/Values Ed. ☐ Chemistry ☐ English ☐ TLE/ IT ☐ General Science ☑ Physics ☐ Filipino ☐ MAPEH ☐ Biology ☐ Math ☐ Araling Panlipunan ☐ CAST

Type of Activity: ☑ Concept Notes ☐ Laboratory Report ☐ Formal Theme ☐ Others: ☑ Skills / Exercise / Drill ☐ Drawing / Art ☐ Informal Theme

Activity Title: Centripetal Acceleration - Derivation (Part 1 - change in velocity)
Learning Targets: To apply vector subtraction for the change in velocity in uniform circular motion
Reference: Title: LPON - PIP 1
Author: C.C Bernido, Ph.D and M.V.C Bernido, Page Numbers: 27

Let us look at the top view of the circular path, and draw the velocity vectors and position vectors of the object at two different points of its path. Recall that the velocity vector is always tangent to the circle, while the position vector, relative to the center of the circle, is always along a radius of the circle.

We can get the change in velocity by putting the velocity vectors together. Applying vector subtraction, we have,

$\Delta\vec{v} = \vec{v}_2 - \vec{v}_1$

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SCIENCE COMMUNICATION !

STEM Grades 11-12
Scientific Poster Session

Video production created by students

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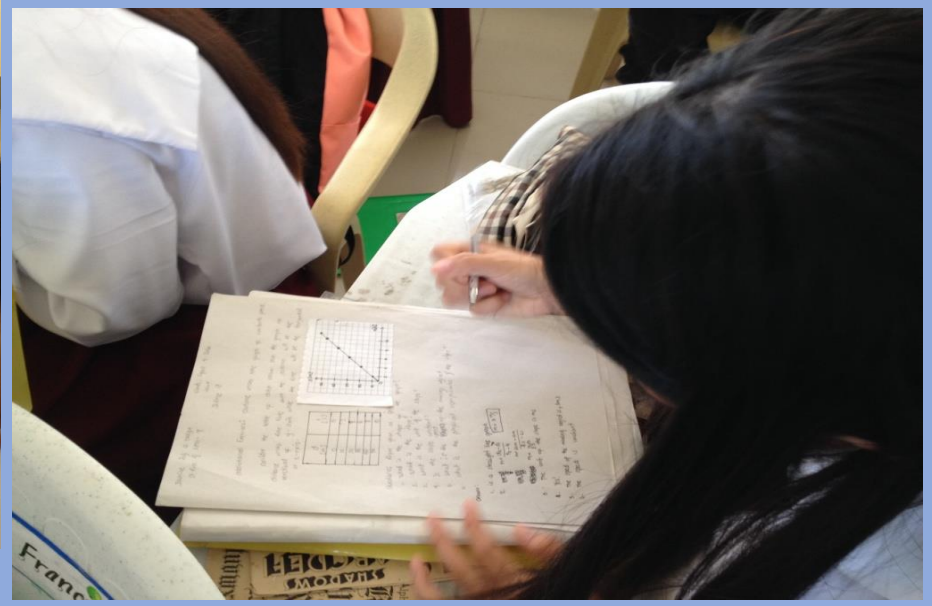
CVIF-DLP *teaches COLLABORATION*



Strong in-school collaborative learning since the Expert Teacher does not dominate in the classroom 70 % of the period.

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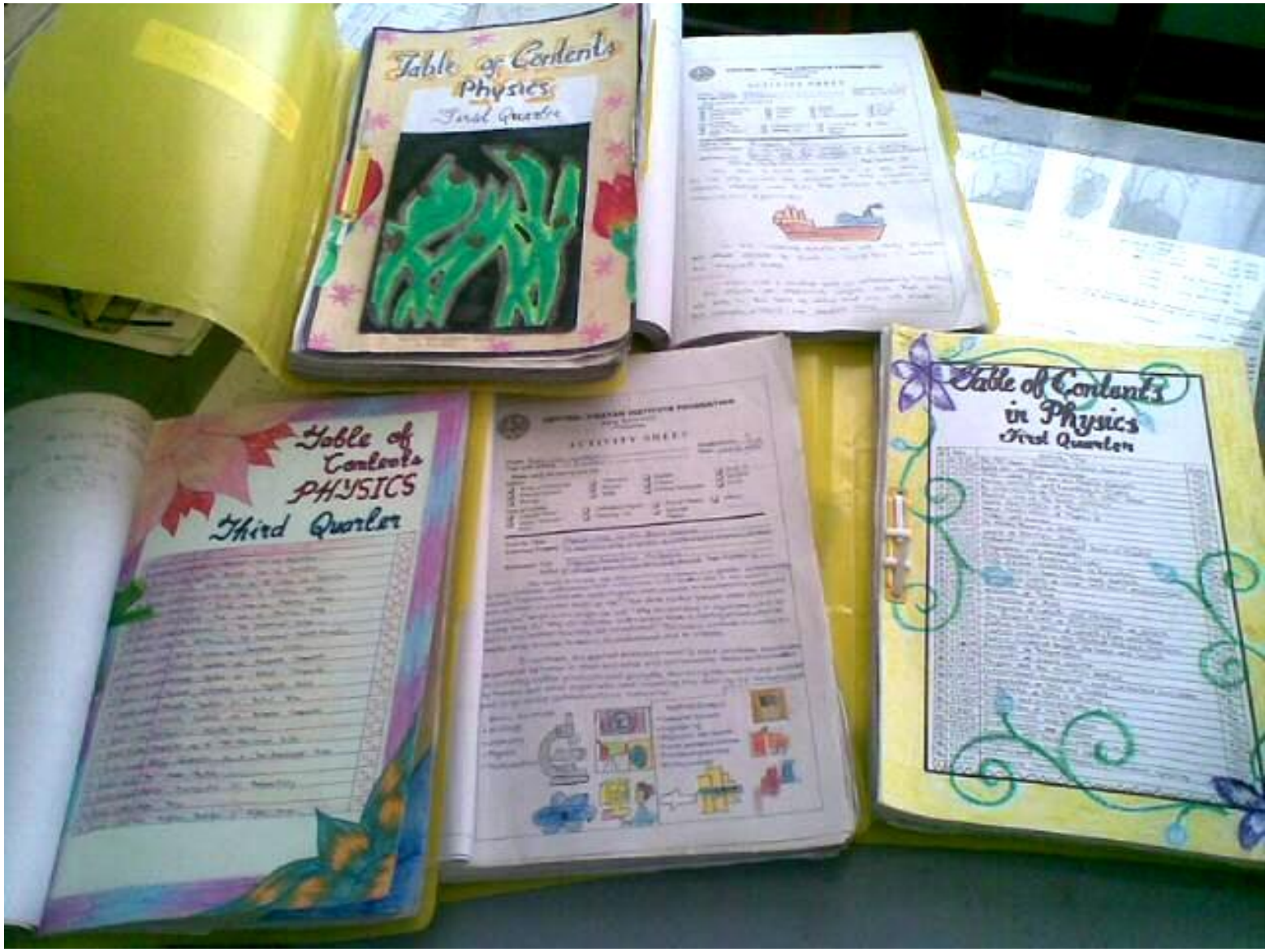
FOSTERING AN ORGANIZED MIND: Student Comprehensive Portfolio

- Compilation of all activities, exams, quizzes, concept notes
- Color-coded for subject areas
- Cumulative scholarship (typical of scientists' works)
- In-school Portfolio Policy



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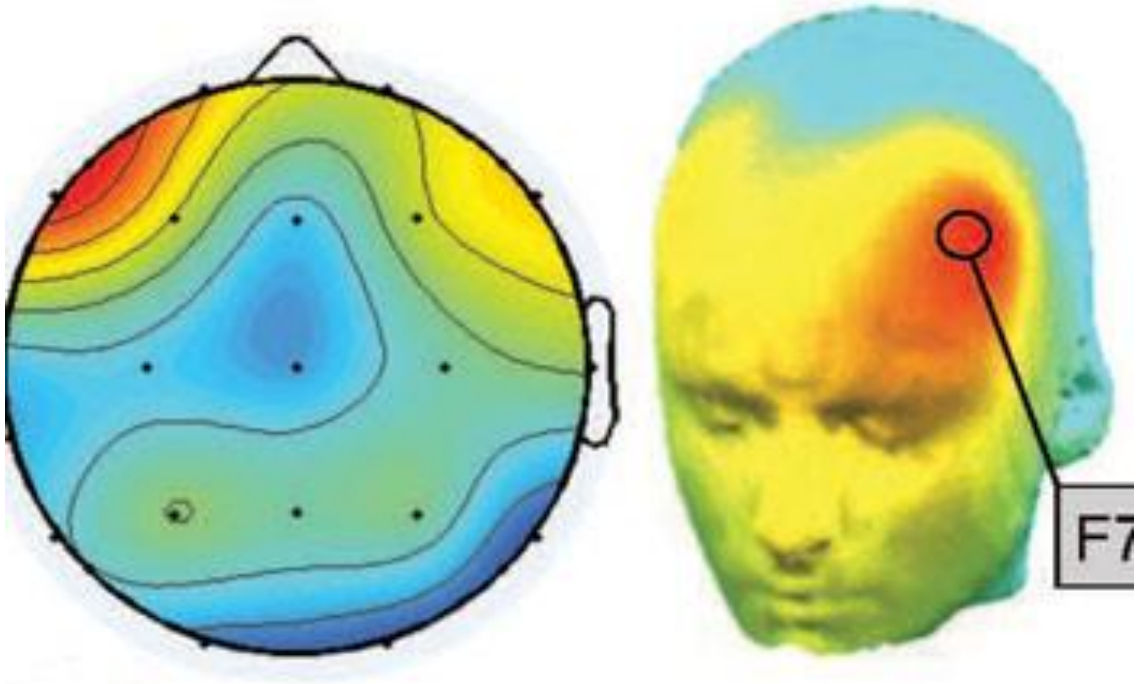
STRATEGIC REST: *No Homework from Grades 7 to 12 ;*
Light load mid-week

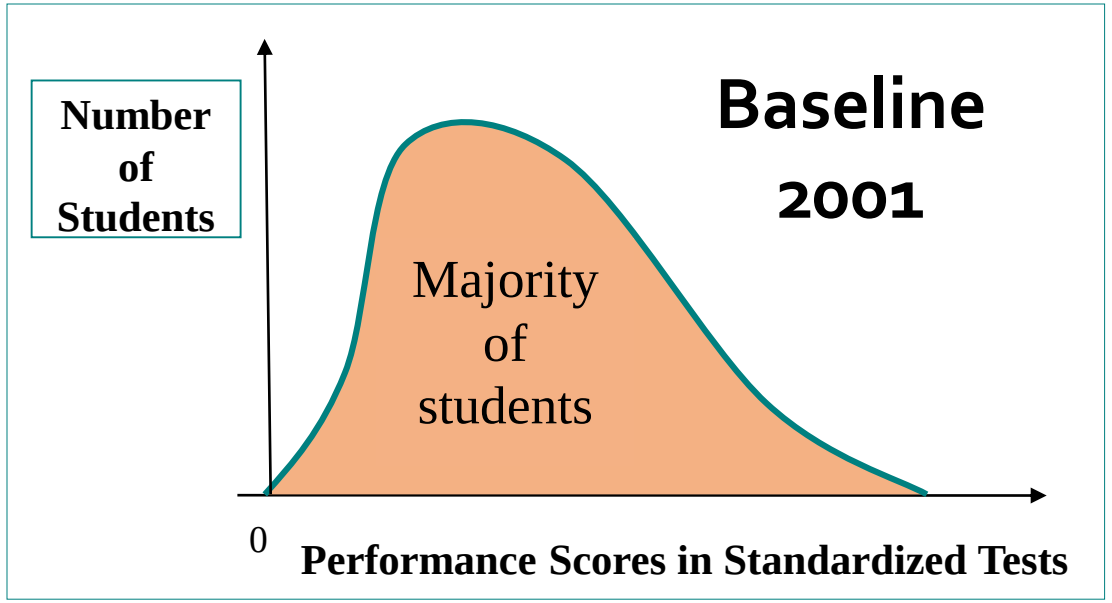
Sleep Spindles: fast burst of brain waves while sleeping. The more sleep spindles, the **more refreshed for learning** .

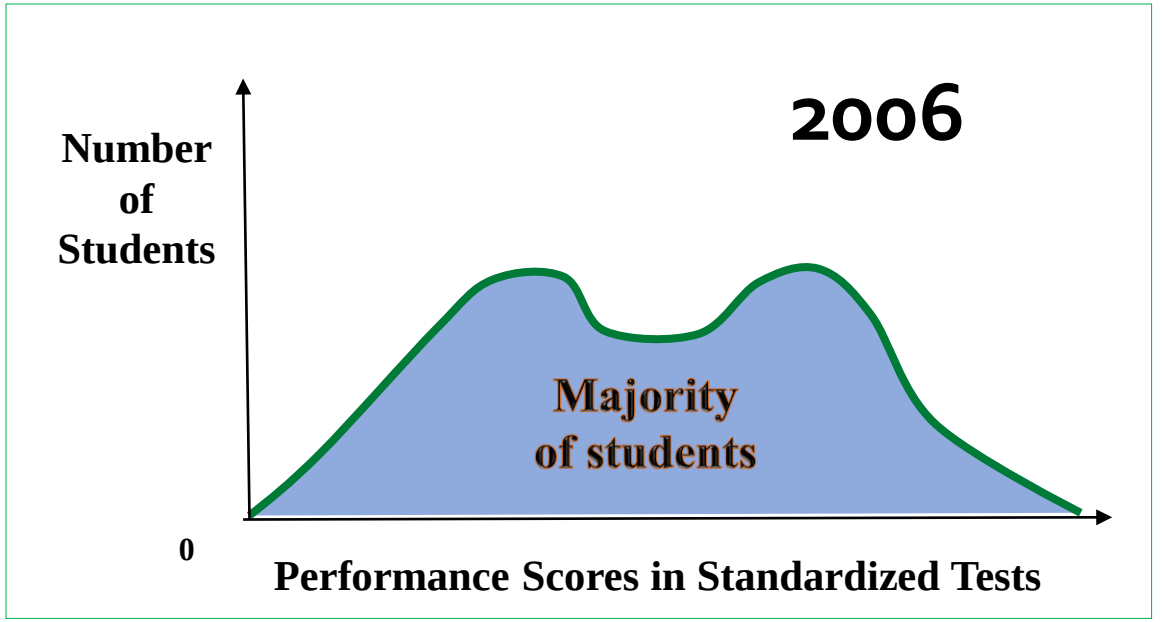


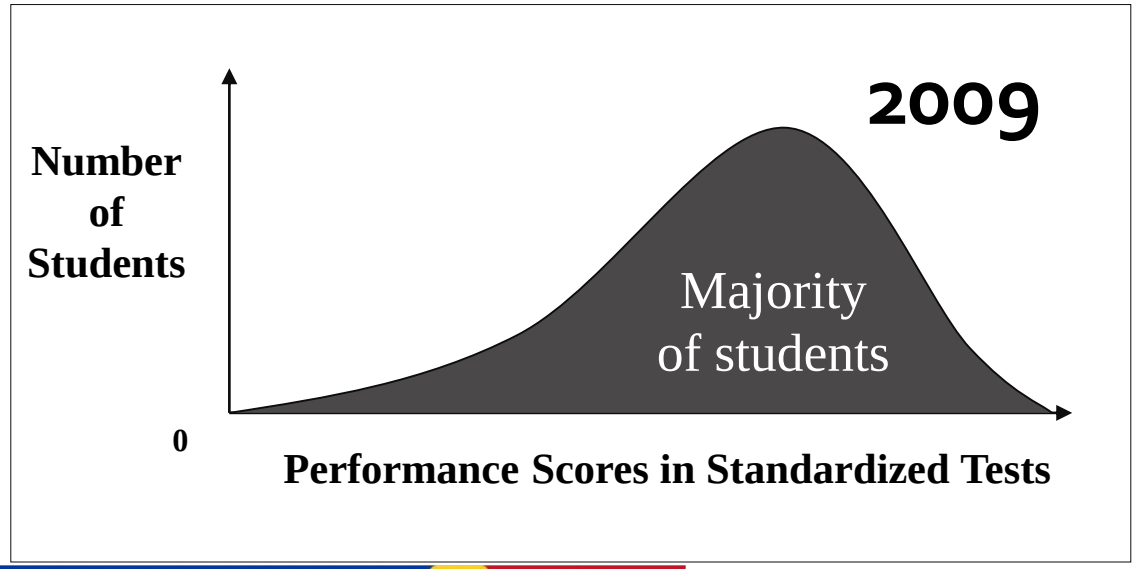
"This discovery indicates that we not only need sleep **after learning** to consolidate what we've memorized, but that we also need it **before learning**, so that we can recharge and soak up new information the next day."

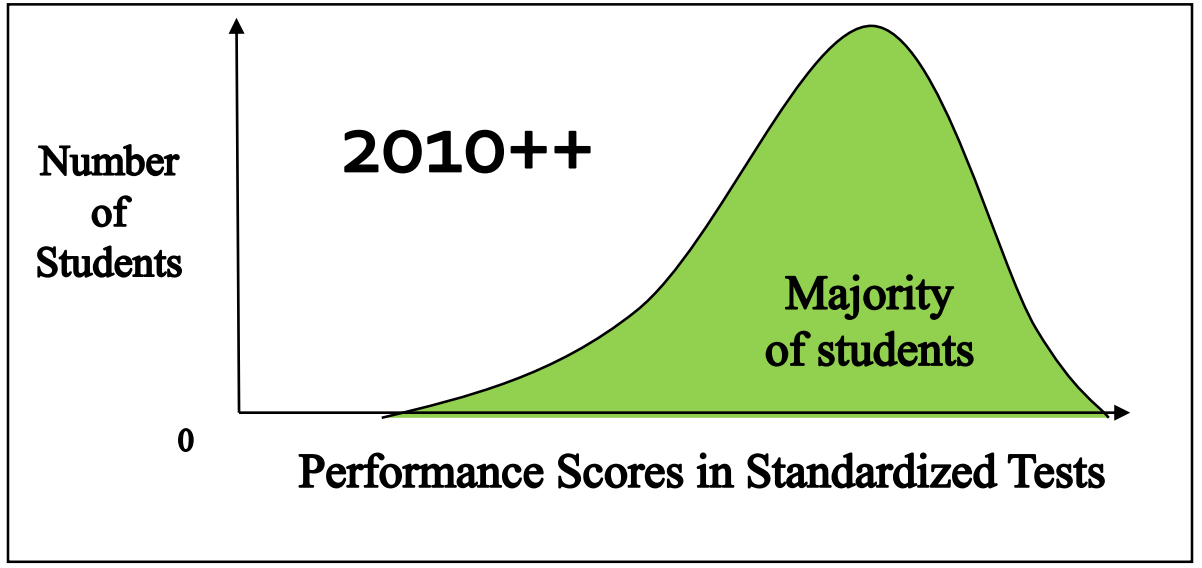
http://news.berkeley.edu/2011/03/08/sleep-brainwaves/

NSAT / NCAE of CVIF Students (CVIF-DLP started 2002)









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CVIF Alumni

Ronald Lloren (*CVIF 2005*): doing his Ph.D. (Marine Science) at **ETH Zurich (Swiss Federal Institute)** .

ETH Zurich: ***Number One*** *in the world in Earth and Marine Sciences (2018 QS World Ranking by discipline).*

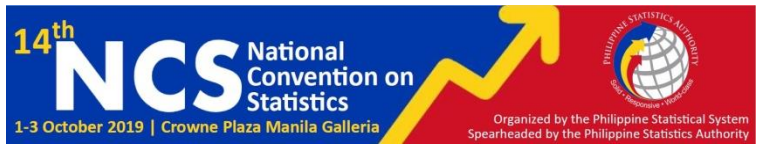
Einstein studied and taught at ETH. *"21 Nobel Prizes so far for ETH Zurich."*

Madelynn Nayga (CVIF 2009) in Ph.D. (Physics) at **Max Planck Institute** (MPI) and University of Dresden, Germany. MPI programs are highly competitive.

Ms. Nayga topped the 2017 Condensed Matter Physics post-masteral 10-month Diploma Class at the International Centre for Theoretical Physics, Trieste, Italy.

Jesha Caseñas (CVIF 2005) graduated B.S. Anthropology from University of California (UC), Berkeley. *22 Nobel Prizes have been awarded to* ***UC Berkeley*** *faculty*

27 CVIF students passed the UPCAT for AY 2019-2020.

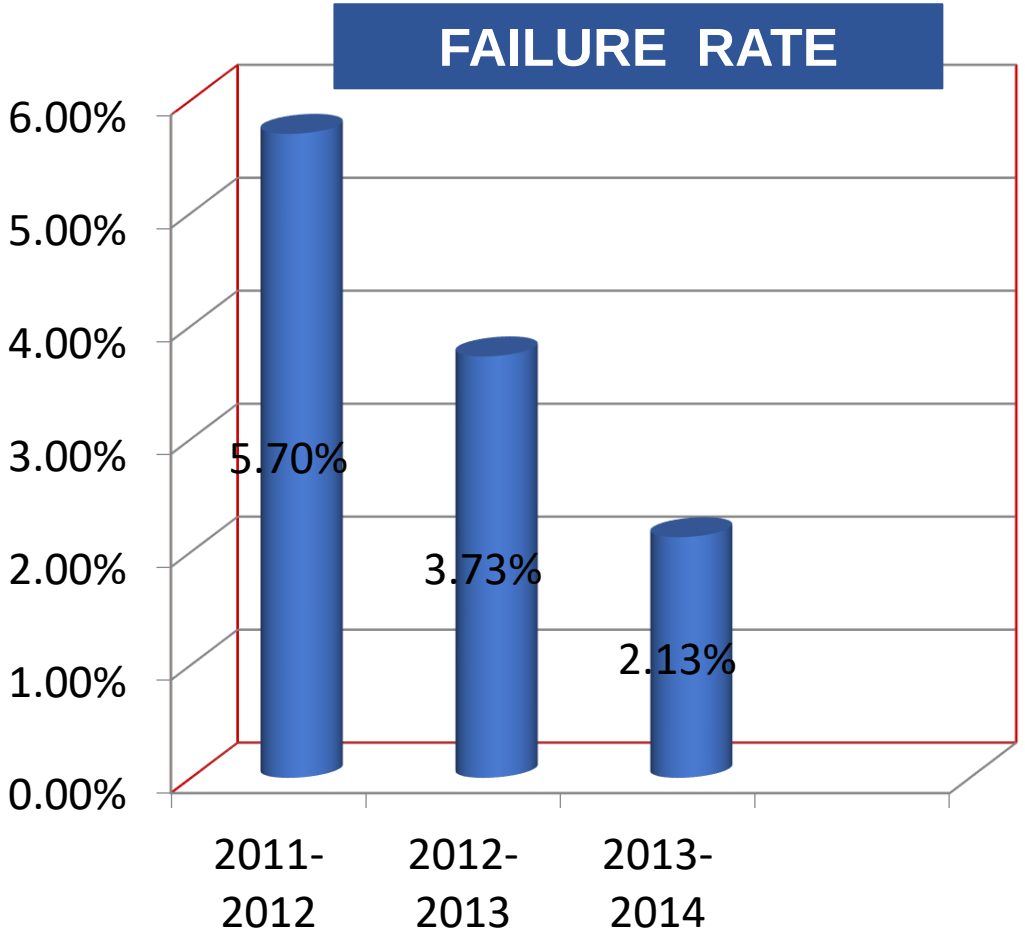


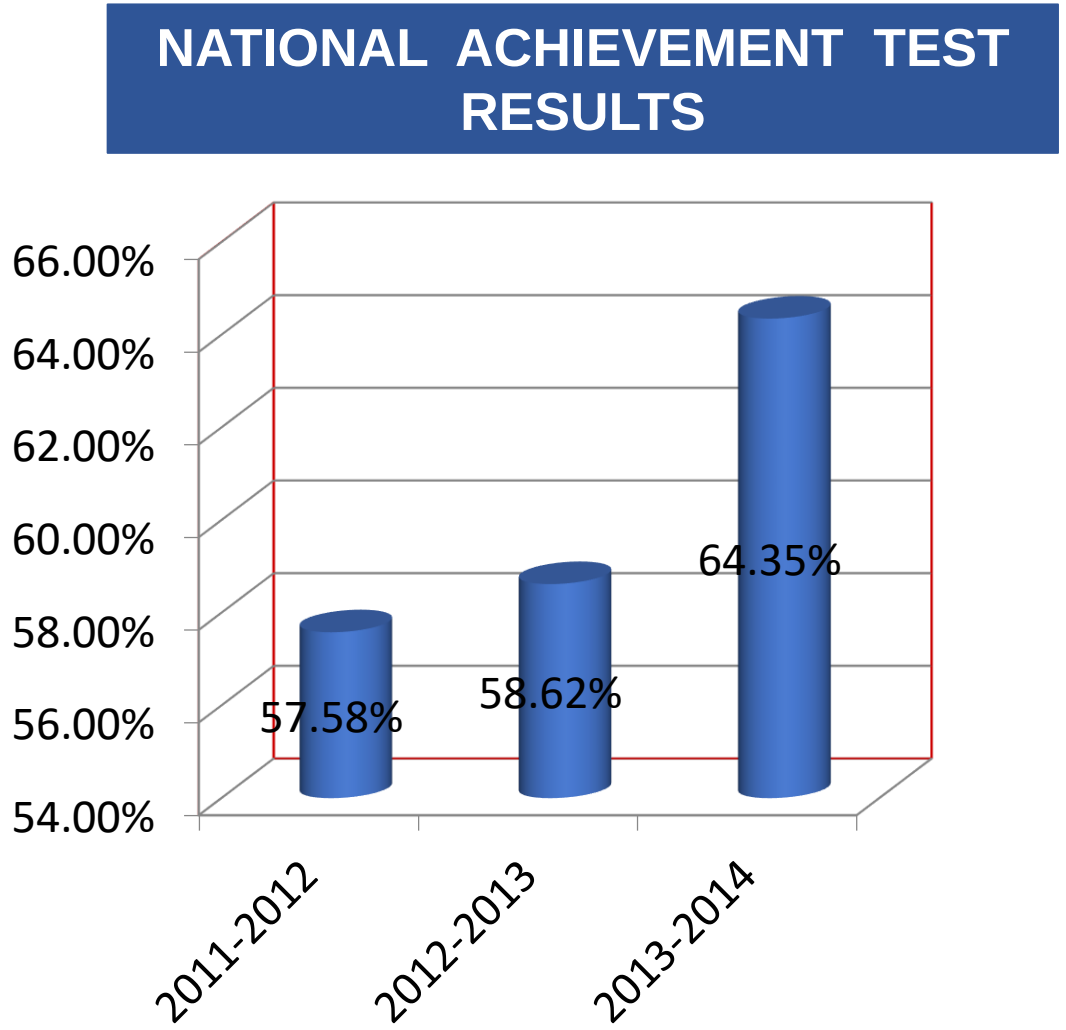
NCAE Time Series

Year	N	MA/VA	MA/RC	SA/VA	SA/RC
		r	r	r	r
2016	212	0.4905	0.6247	0.4999	0.6701
2015	184	0.4314	0.4603	0.4612	0.551
2014	175	0.4244	0.5942	0.5432	0.62
2013	139	0.4925	0.5783	0.6512	0.7571
2012	120	0.4971	0.5232	0.5595	0.5593
2011	119	0.5454	0.5777	0.675	0.6844
Total	**949**				
Mean	158	0.4802	0.5597	0.565	0.6403

Impact of CVIF-DLP in Bohol, Philippines

Department of Education (Province of Bohol) (**162 Public High Schools**)





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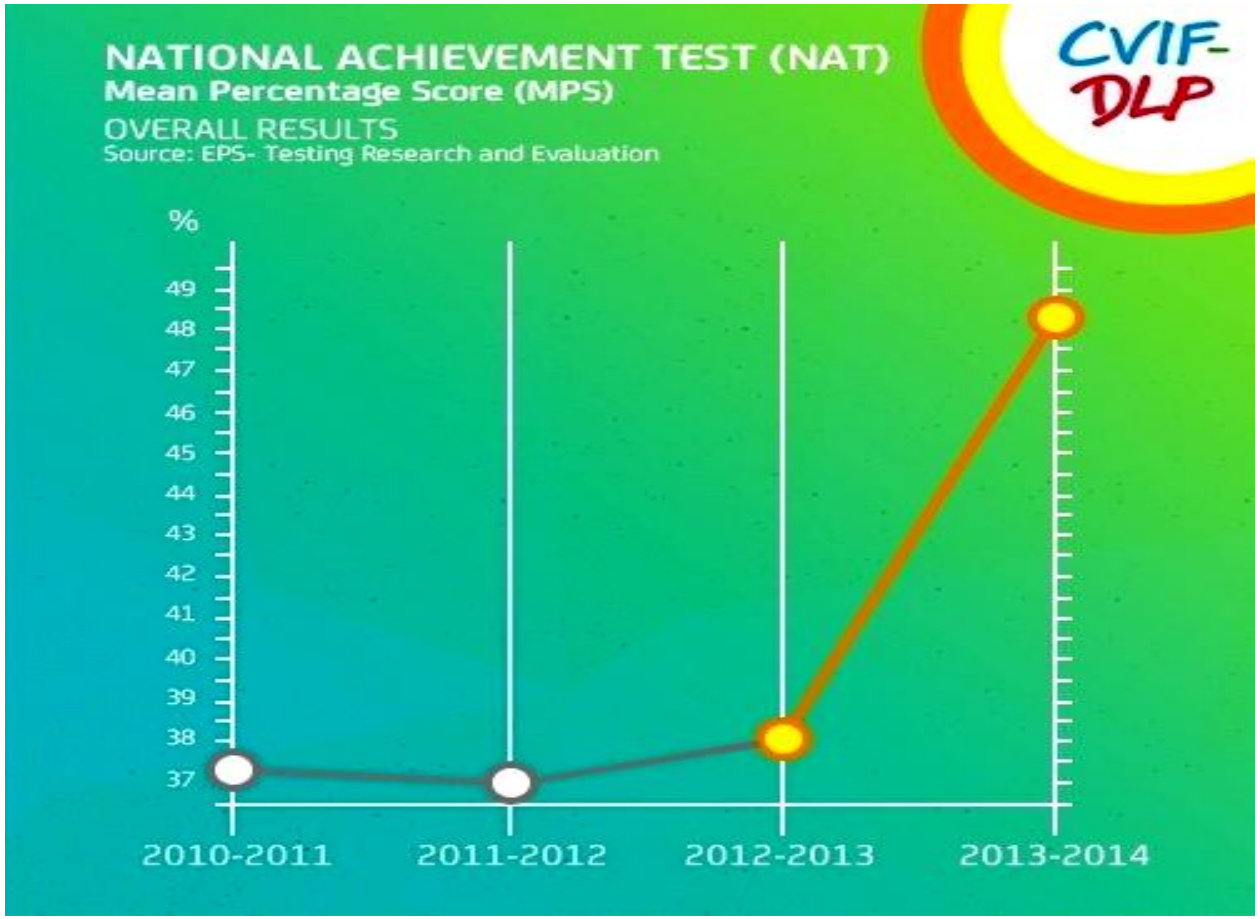
Impact of CVIF-DLP in Basilan, Philippines

Department of Education (Basilan, Mindanao) 19 Secondary Schools



Partners: Local Government Unit

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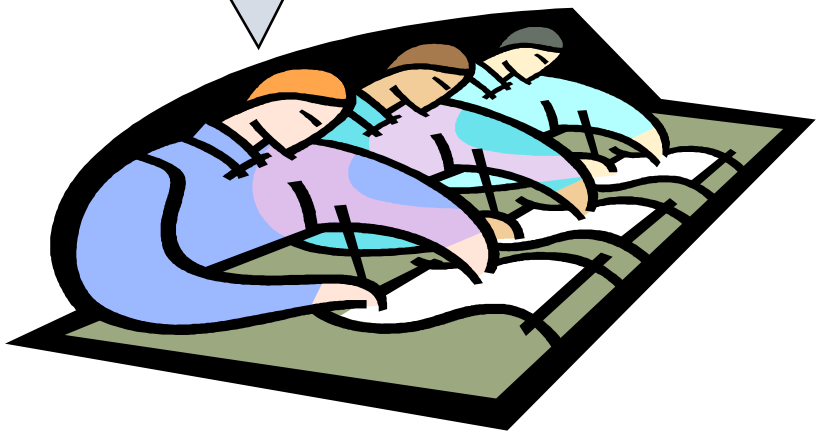
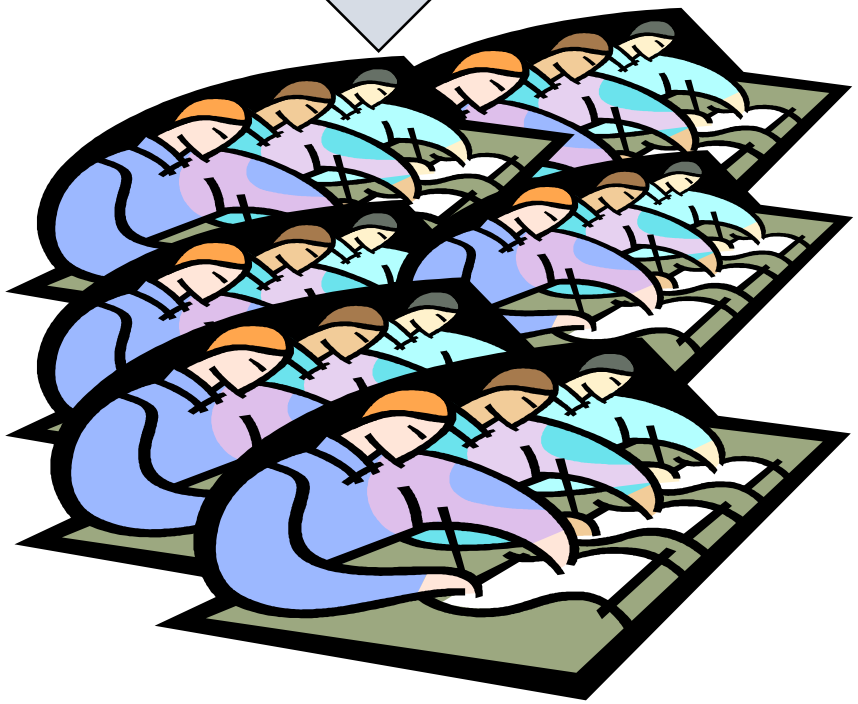
SMART

PLDT SMART FOUNDATION

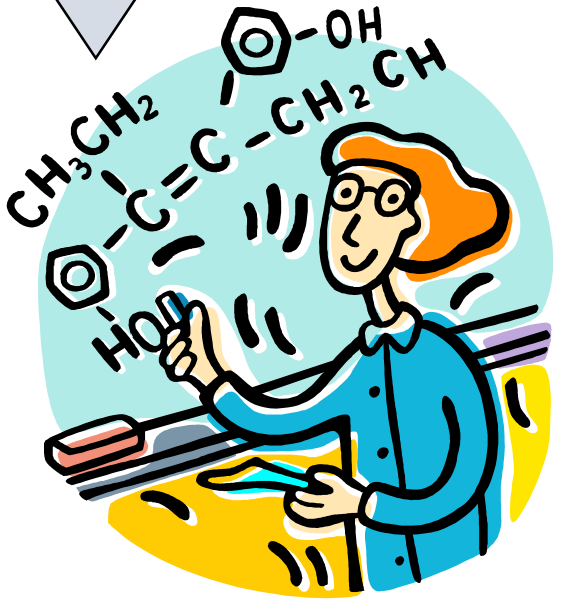
Learner Disposition: Habit-forming Daily Protocol where students are engaged.



Large Classes: Activities are individualized



Lack of Qualified Teachers: Students do learning activities 70-80% of the time.



Thank You !