<table>
<thead>
<tr>
<th>Programa</th>
<th>Erasmus +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acción clave</td>
<td>Cooperación para la Innovación y el intercambio de buenas prácticas</td>
</tr>
<tr>
<td>Acción</td>
<td>Asociaciones Estratégicas</td>
</tr>
<tr>
<td>Campo</td>
<td>Asociaciones estratégicas para la educación escolar</td>
</tr>
</tbody>
</table>

**B.1. Identificación del Proyecto**

<table>
<thead>
<tr>
<th>Título del proyecto</th>
<th>Hábitos del sueño y rendimiento escolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrónimo del proyecto</td>
<td>SHASTU</td>
</tr>
</tbody>
</table>
Why are we here today?

Why we need sleep?

It is important for learning?
Level 0 (0-3 y): Pre-primary education
Initial stage of organised instruction
Designed for children aged at least three years.

Level 1 (5–7 y): Primary education
Begins between five and seven years of age,
Generally covers six years of full-time schooling.

Level 2 (7-15 y): Lower secondary education
Teaching is typically more subject-focused.
Usually, the end of this level coincides with the end of compulsory education.

Level 3: Upper secondary education
The entrance age is typically 15 or 16 years.
“SCOOL READINESS”

- Child physical health and well-being.
- Social competence
- Emotional maturity
- Language and cognitive skills
- Approach to learning.

child's academic ability

School performance
These factors reflect the sum of:

a) Biological component of the student's health.

b) Experiences that have been exposed throughout life.

a) Lifestyle and living environment.
The daily expression may be affected by the student's own acute factors including:

- **chronic lack** of sleep,
- **poor sleep quality,**
- **nutritional deficits** or
- **situational factors** of its microenvironment such as family or couple, conflicts are included.
“Taking these factors into account during the school years can help improving their school performance and behavior”.
The aim of this project is to help answer two questions:

1ª If the student sleeps for an optimal time, do their academic performance and behavior improve?

If the answer is cost-effective schools, should introduce in their programmes knowledge and training about of this area of health.

What time is the best to study a complex matter and examine it?

The best times of day dependent cognitive or physical abilities required to perform the tasks.

Knowing these moments and try to select the optimal schedules for the activities, facilitates and optimizes performance.
It is important to note that:

Sleep disturbances:
- High prevalence.
- Most behavioral origin.
- Very responsive to preventive measures changes in lifestyle.

School time is highly efficient:

detection / prevention / treatment
Children with sleep problems (time, quality...) are more likely to have difficulties in school performance and behavior problems.

This situation can occur with reductions in sleep time so small only 30 minutes / day.
Sleep-deprivation induces memory encoding impairments

- Sleep control
- Sleep deprivation

n=28

All stimulus types combined

40%

POSITIVE

59%

NEGATIVE

19%

Neutral

43%

*P<0.05
**P< 0.01
n.s.: Non-significant
The second question is:

How can we do it?
Improving our knowledge of good rest and its importance in school performance.

Recognize the circadian rhythms of learning and behavior. It is different throughout the day.

Applying this knowledge in our daily work with students and families.
¿4 - 6 - 8 - 9 - 10?
# How much sleep do I need?

<table>
<thead>
<tr>
<th>AGE</th>
<th>RECOMMEND AMOUNT OF SLEEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEWBORNS</td>
<td>16 -18 h / day</td>
</tr>
<tr>
<td>PRESCHOOL- AGED CHILDREN</td>
<td>11- 12 h / day.</td>
</tr>
<tr>
<td>SCHOOL-AGED CHILDREN</td>
<td>At least 10 h / day.</td>
</tr>
<tr>
<td>TEENS</td>
<td>9 – 10 h / day.</td>
</tr>
<tr>
<td>ADULTS</td>
<td>7 – 8 h / day.</td>
</tr>
<tr>
<td>HORAS</td>
<td>LABORABLES (%)</td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
</tr>
<tr>
<td>5 a 6</td>
<td>4,1</td>
</tr>
<tr>
<td>6 a 7</td>
<td>9,9</td>
</tr>
<tr>
<td>7 a 8</td>
<td>38,8</td>
</tr>
<tr>
<td>8 a 9</td>
<td>35,0</td>
</tr>
<tr>
<td>9 a 10</td>
<td>7,5</td>
</tr>
<tr>
<td>10 a 11</td>
<td>0,0</td>
</tr>
<tr>
<td>más de 12</td>
<td>0,0</td>
</tr>
<tr>
<td>¿?</td>
<td>4,7</td>
</tr>
</tbody>
</table>

TV use has consistently and inversely been associated with sleep duration as well as delayed bedtime and wake-up time.

Feeling sleepy during the day in class

Valencia. SPAIN

<table>
<thead>
<tr>
<th>AGE</th>
<th>TIMES SLEEPY / W</th>
<th>More than 4 times</th>
<th>2 -4 t.</th>
<th>&lt; 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8</td>
<td></td>
<td>20,8</td>
<td>25,3</td>
<td>54,0</td>
</tr>
<tr>
<td>9 - 11</td>
<td></td>
<td>10,4</td>
<td>40,1</td>
<td>49,5</td>
</tr>
<tr>
<td>12-15</td>
<td></td>
<td>20,1</td>
<td>46,4</td>
<td>33,4</td>
</tr>
<tr>
<td>GLOBAL</td>
<td></td>
<td>17,3</td>
<td>34,6</td>
<td>48,1</td>
</tr>
</tbody>
</table>

51.9 %

G. Pin Arboledas, M. Cubel Alarcón, G. Martín González, A. Lluch Roselló, M. Morell Salort
Hábitos y problemas con el sueño de los 6 a los 14 años en la Comunidad Valenciana. Opinión de los propios niños. An Pediatr. 2011;74(2):103-115
Share of pupils sleepy during the day in two centers of different economic status

ESD: 28.1% - 26.8%

ESD: 18.3% - 23.4%

Optimal time learning appears to lie between 10 and 12 am and 5-6 pm

Sleep in class: 1.4% 5-7 t/w

BMC Public Health 2006, 6:118
But...

What is sleep?
ETAPAS DEL SUEÑO

VIGILIA

REM

HIPNOGRAMA

REM AUMENTA EN LA SEGUNDA MITAD DE LA NOCHE
C = T x P
More than 80% of young people in the EU participate in social networks.
In 2012, for the first time, a higher proportion of young people made daily use of the internet than of a computer — reflecting increased uptake in the use of a range of alternative devices, such as smartphones.
Protect children and to make children and young people more aware of the risks involved with using the internet, while teaching digital literacy so that children may benefit fully and safely from being online. The strategy, which was adopted in May 2012, is constructed around four pillars:

a) stimulate quality content online for young people;
b) step up awareness and empowerment;
c) create a safe environment for children online;
d) fight against child sexual abuse and child sexual exploitation.
The more technology in the bedroom = poorer sleep quality

**Figure 1**  Use of electronic devices during the last hour before bedtime among girls and boys in the youth@hordaland study (n=9846). Error bars represent 95% CIs.

High **screen time** and deprivation may explain lateness in bedtime.


- OR: 1.50, CI: 1.07–2.09
- OR: 1.97; CI: 1.34–2.89
High screen time leads to:
- Late-night screen time
  - Increased opportunity to eat
  - Increased energy (calorie) intake
  - Sleep deprivation
    - Reduced energy expenditure
    - Mode of transport
      - Physical inactivity
Recent energy intake and expenditure lead to:
- Obesity
School performance fluctuates throughout the day.

Minimum: 8 and 9 o'clock.

Peaking: 11 and 12 o'clock.

Descends after food.

Rises again more or less (age).

Fig. 18. Patrones diarios de los alumnos del CM 2 en cuatro pruebas: operaciones, cubos, series verbales y conjugación.

The longer we are awake: worst school performance

Prior waking hours

Cronopsicologia y ritmos escolares. Testu. 1991 pag 26
Exposure to bright light during evening lessons increases alertness among working college students.
Adapt the design **school schedules and distribution of subjects by age of students**...

... and improve the handling of light in classrooms, with **varying light intensity by time of day**, are two factors that can contribute to creating good sleep habits and improve school performance.
GENERAL RULE:
LEVEL OF PERFORMANCE IS RAISED AT THE END OF THE MORNING

5 – 9 Y:
RESULTS WORST AFTERNOON

10 – 11 Y:
RESULTS SAME MORNING AND AFTERNOON
The third question is:
All this is part of our work?
The answer is "of course":

Improving our efficiency and quality of student life
Obesity

SCHOOL PERFORMANCE - BEHAVIOUR

Melatonin reduction

Wake up late in the morning

Go to bed late in the night

Light exposure at night

Inadequate sleep hygiene

Sleep insufficiency

Circadian desynchronization

Unfavorable physical & mental conditions

Insomnia

Unfavorable physical activity

Low serotonergic activity

Daytime sleepiness

Low physical activity

Obesity

SCHOOL PERFORMANCE - BEHAVIOUR
Sleep problems during development are associated with impaired executive functions.

The improvement of sleep problems during growth decreases involvement of executive functions.
Chronic lack of sleep:

Language problems x 3.

Alters acquisition and consolidation of language

Touchette E; Petit D; Séguin JR; Boivin M; Tremblay RE; Montplaisir JY. Associations between sleep duration patterns and behavioral/cognitive functioning at school entry. SLEEP 2007;30(9):1213-1219.
THE REALITY IN OUR ENVIRONMENT:

632 children. Age: 3 – 14 years

Comunidad Valenciana (España):

1,4% sleeping in class 5 – 7 times a week .

11.5 % sleeping in class 2 – 4 times a week.

G. Pin et al. An Ped. 2011
Comunidad Valenciana (España):

29 % scholars:

Difficulty maintaining wakefulness during school hours.

2,8 %: 5 - 7 times a week.
13,2 %: 2 – 4 times a week.
Comunidad Valenciana (España):

They sleep in class 2-4 times a week:

1º de la ESO, el 11.2 %
2º de la ESO: 2,99 %
Comunidad Valenciana (España):

14-16 y

< 8 sleep in scholar days: 52,8 %
We all have a serious problem:
Students, families, educators ... society in general has a big challenge.
Some countries are already looking for answers:

“A proposal concerning children’s sleep” (Committee for School Health, Japanese Society of Child Health, 2011)
Conclusions:

It is a social responsibility of school health science to draw a picture of children biological rhythms and daily activities that is as accurate as possible.
Students who report insomnia, inadequate sleep, daytime sleepiness, irregular sleep patterns and/or poor sleep quality do not perform as well in school as others (Blum et al., 1990; Link and Ancoli-Israel, 1995; Hoffamn and Steenhof, 1997; Wolfson and Carskadon, 1998, 2003; Shin et al., 2003; Millman, 2005).

Children enrolled in remedial school programs report significantly more sleep problems (Blunden and Chervin, 2008).

A large study in the Spanish secondary school system ($N = 1155$, mean age 14) found a significant correlation between class failure and sleep complaints, and morning sleepiness (Salcedo et al., 2005).
“Everything possible should be done to favor sleep as deep and sound in quality and usually as long in quantity as possible, and everything that seriously interferes with this end should be sedulously avoided...No one should be allowed to go to school at all without [at least] nine hours of sleep...”

GS Hall 1904.
The training program in sleep should be included in the regular training sessions, ideally introduce these sessions as part of the activities for other purposes (tutorials, meetings APA ...).

Several authors have shown that in terms of knowledge acquisition health education itself is rarely sufficient to change behavior so that sessions should not only consist of vertical transmission of knowledge (Tobler Lessons NS J Prim Previous 2000 ; 20: 261-74 ..).

The overall objective is to include the sleep within a healthy lifestyle along with nutrition and physical activity.
The components related to sleep / rest should include:

a) Sleep needs / age
b) The consequences of poor sleep hygiene
c) Proper sleep hygiene, according to age.
d) The sleep-wake schedules and appropriate use of light in the morning.
e) Control of stimuli: basics.
f) Improving sleep habits / cognitive strategies of rest.
g) To improve knowledge about sleep:
   - Decreases aggression in class.
   - Improves performance
   - It will be less hyperactive
   - Parents rest more.
SOME EXAMPLES OF POSSIBLE ACTIONS
2-5 years

• During the day, is recommendable that children take a nap as a complement to nighttime sleep.
• Avoid putting a child to bed hungry or after drinking too much liquid.
• Do away with consuming stimulating beverages/foods (chocolate, cola beverages, etc.).
• Try to avoid vigorous physical activity 1-2 hours before putting the child to bed.
• Avoid very long or late naps.
• Be especially careful about not emphasising anxiety or fear by alluding to the ‘bogeyman’, ghosts, etc.
• Avoid associating food or sleep with punishment or rejection.
• If the child sporadically has difficulties getting to sleep, think about what has happened during the day, and don’t shout at the child.

Security and calmness should be the message sent to the child.
2-5 years (2)

- No time limit for falling asleep that day should be imposed: it will be very difficult to meet that limit, and the child’s anxiety or nervousness will increase.
- A parent mustn’t lose their cool.
- If parents get upset, a child will become even more agitated. A couple should take turns. If this is not possible, the parent should leave the room for a few minutes, rest, drink some water and when they are more relaxed, start again.
- At this age, routinely sleeping outside the bed is not going to help a child learn to fall sleep
Primary education (6-14 years)

Both educators and parents must know that:

• Cooperation between parents and teachers, even though it becomes more difficult as children grow and the parents’ presence at school decreases, continues to be essential.
• The teaching-learning process clearly benefits when the subject has adequate health habits.

In the education system, it must be taken into account that:

To the extent possible, the attempt should be made to schedule physical activity during the first hour of the morning.
The causes of fatigue in some children come from having established inadequate habits for healthy sleep, such as the following:

a) inappropriate schedules;
b) poor use and/or abuse of electronic devices outside or inside of their bedrooms and without control by adults;
c) incorrect eating behaviours (excessive consumption of cola beverages and caffeine, chocolate, pre-packaged pastries, copious dinners) close to bedtime;
d) lack of daily physical exercise.

Primary education (6-14 years)