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BYOD AND TURN TO YOUR NEIGHBOURS

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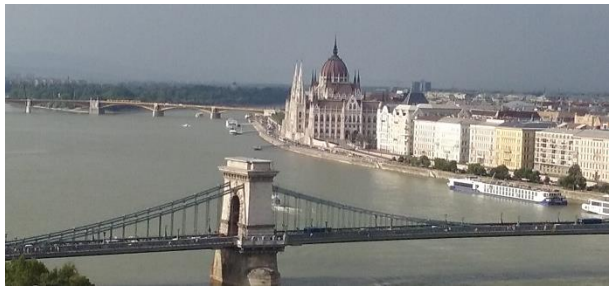

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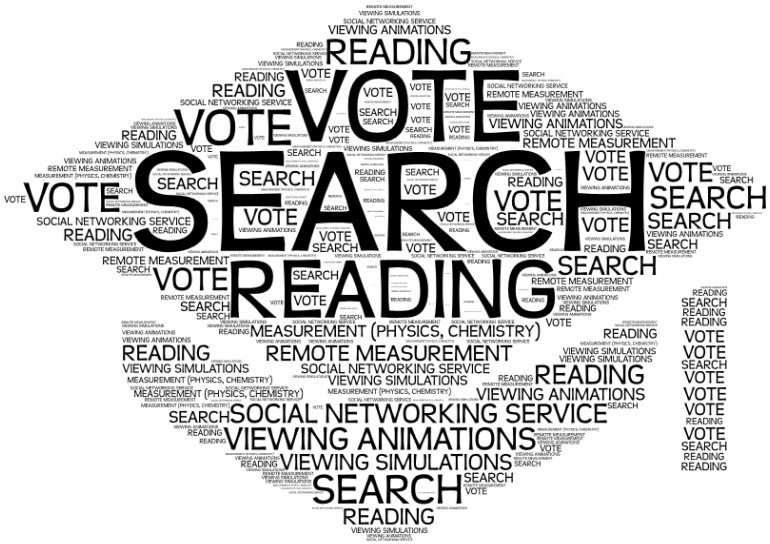
BYOD and turn to your neighbours

1. History, objectives, raising questions

- use of portable devices has been **increased**,
- the **traditional physics** classes **are not** good enough for **attracting the students**' focus to the lectures,
- **students use their devices** for the following purposes :



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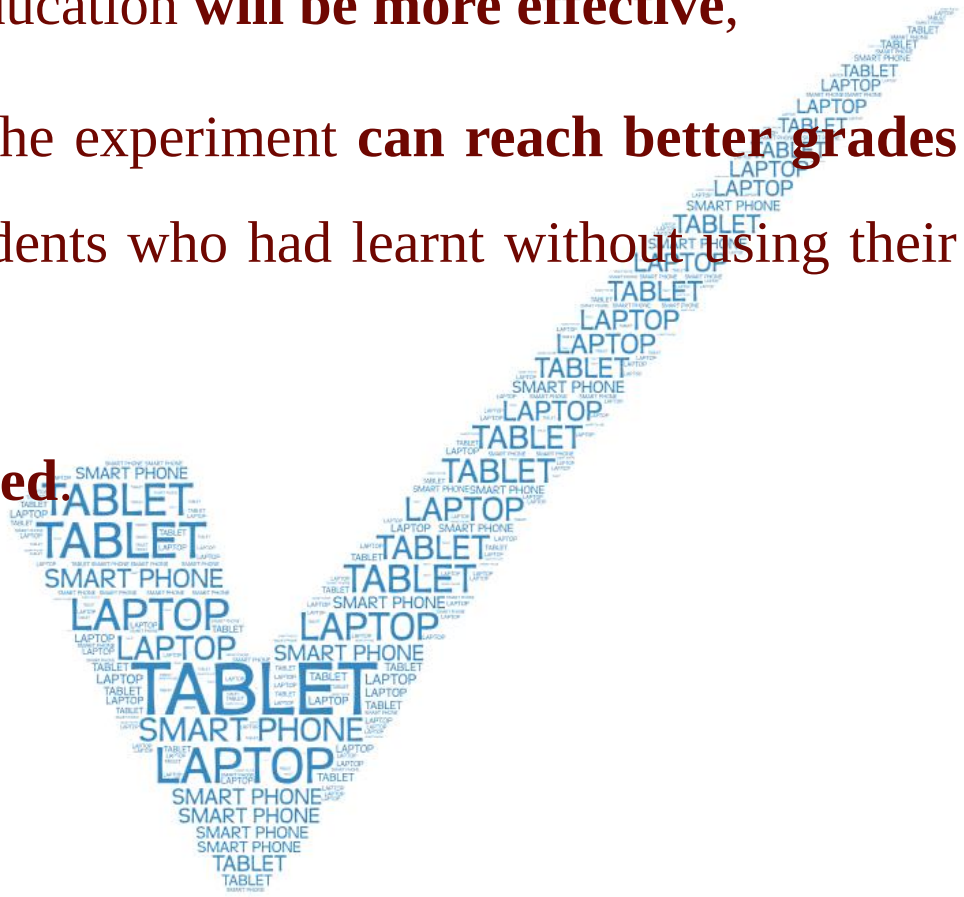
BYOD and turn to your neighbours

2. The issues to be examined

- use of own devices helps **to learn physics more efficiently**,
- **how to use** more efficiently **own mobile devices**, to **perform** the **experiments**,
- are **students more active**, if they use their own devices during the lectures,
- are physics classes considered **more valuable** by the students, if they use their own mobile devices during the

3. Hypothesis

- **using mobile devices** the physics education **will be more effective**,
- **students**' groups who take part in the experiment **can reach better grades** in the examination period, than students who had learnt without using their own devices,
- students will **become more motivated.**



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4. Participants. Students of:

- BSc in Computer (IT) Engineering
- BA in Business Administration and Management

} from Dennis Gabor College, whose study includes courses like: **Physics**

Nr. of students enrolled to Physics course (yearly in II. semester):

total: 188; Full training (FT): 68; Distance training (DT): 120

In the **first year** of BSc studies **all students study the same modules.**

Credits: **5** (first year, II. semester) Written exam

Full training education (FT) L (lecture): 30 hours, S (seminar): 15 hours

Distance training education (DT): L (lecture): 6 hours, S (seminar): 3 hours

Course description: Mechanics; Thermodynamics; Optics; Nuclear Physics

5. Applied research methods

5.1. Collection of information
(General Questions, pre-training)

- before starting the course,
- with own devices (BYOD),
- individually,
- using: EvaSys Education Survey Automation Suite
- 31 questions (different types).

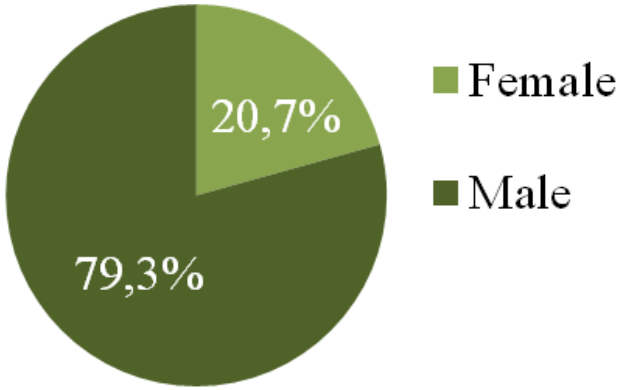
EvaSys for:

- Driving consistency in evaluations
- Easy to use responsive questionnaire templates, for online and paper-based surveys
- Easy to access software
- High volume data capability and analysis
- Allowing to make informed and timely decisions

5. Applied research methods

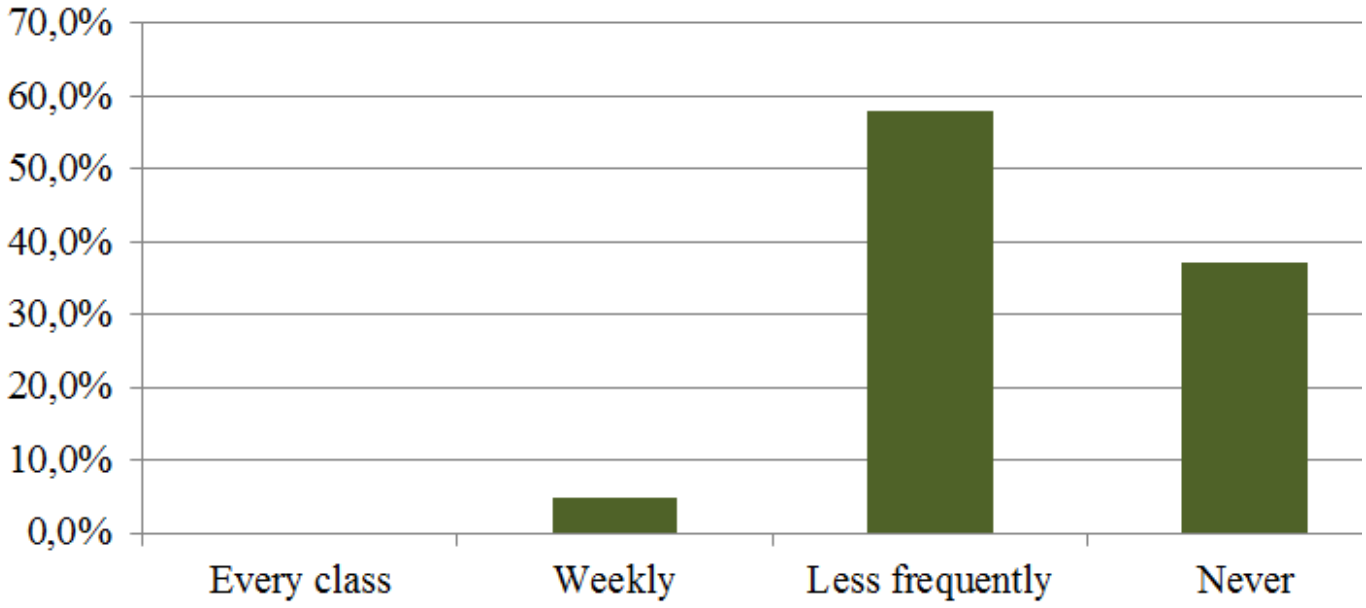
5.1. Collection of information *(results)*

Survey filled by: **82 students = 46,80 %**



Example:

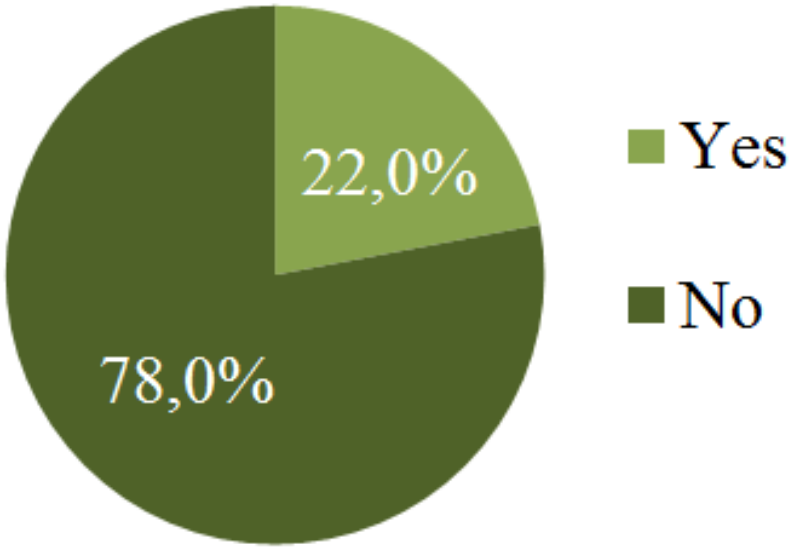
Did you have any hands-on activities or measurements in laboratories, during the Physics classes, in your previous studies?



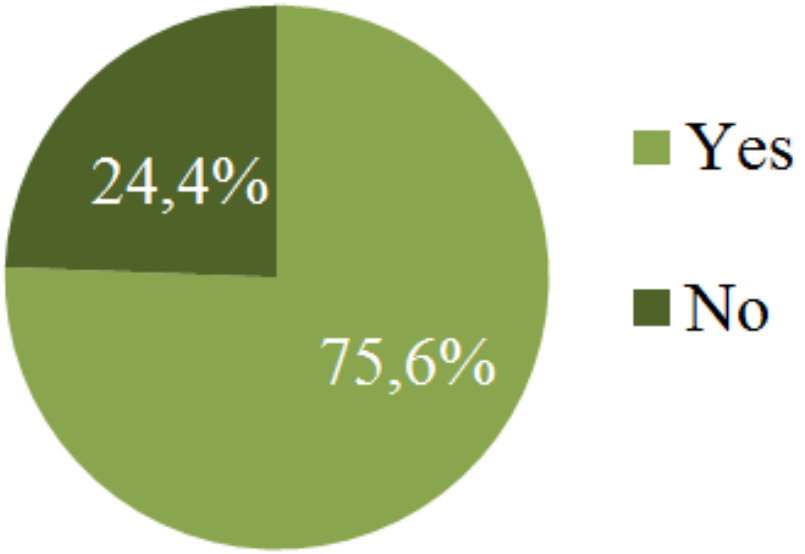
5. Applied research methods

5.1. Collection of information *(results)*

Do you have a graduation exam (baccalaureate) in physics?



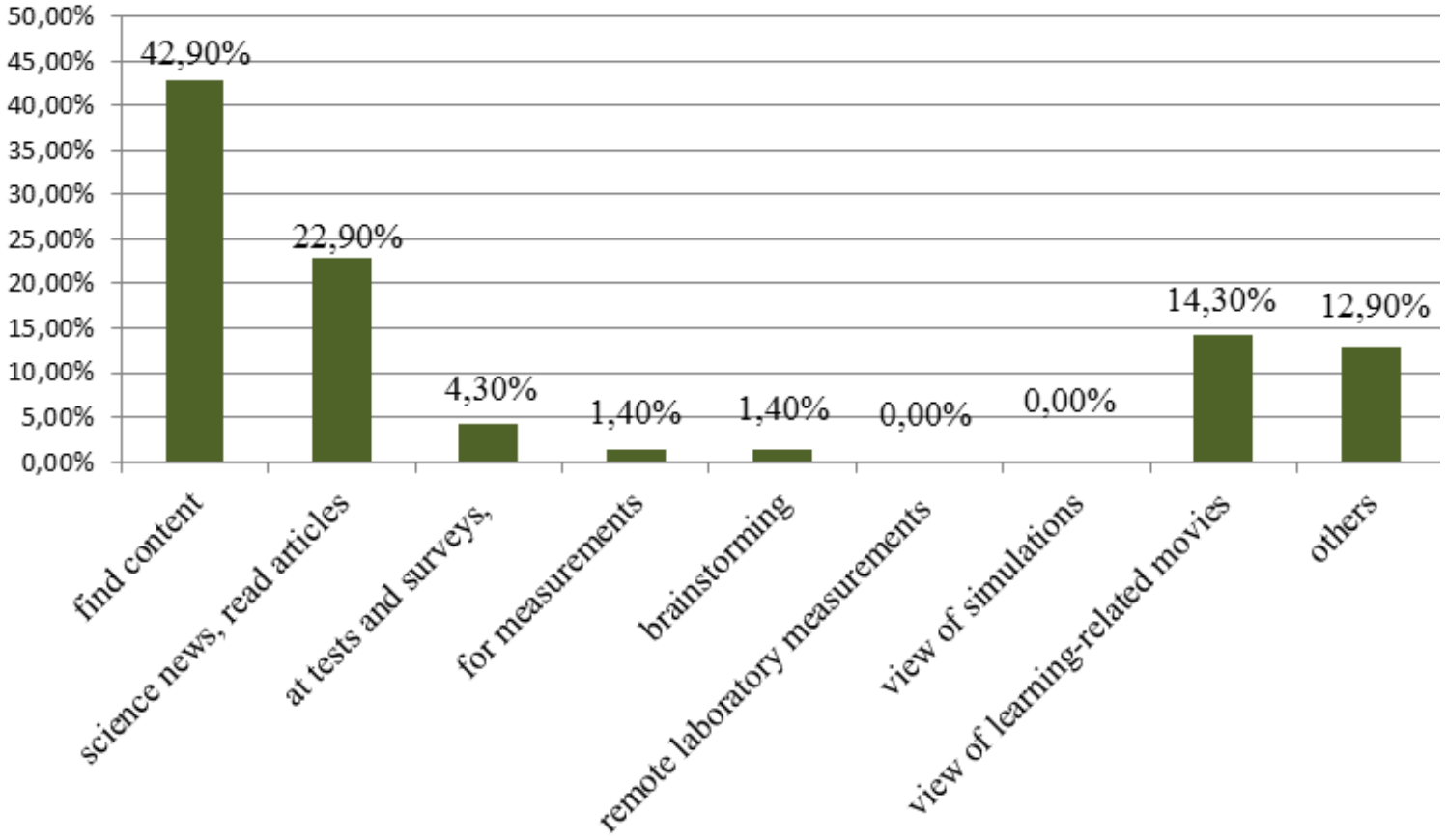
Are you interested in Physics measurements using your own devices ?



5. Applied research methods

5.1. Collection of information *(results)*

... please indicate which of the listed options are you using

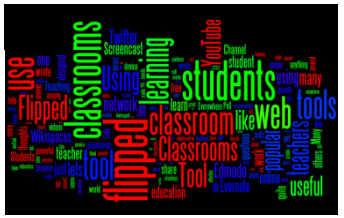


5. Applied research methods

CT

5. Applied research methods

5.2 Skills Survey (TEST)



Traditional Model

Flipped Model

Students are responsible for homework in these levels of understanding

Students and teachers work together during the school day on these levels of learning.

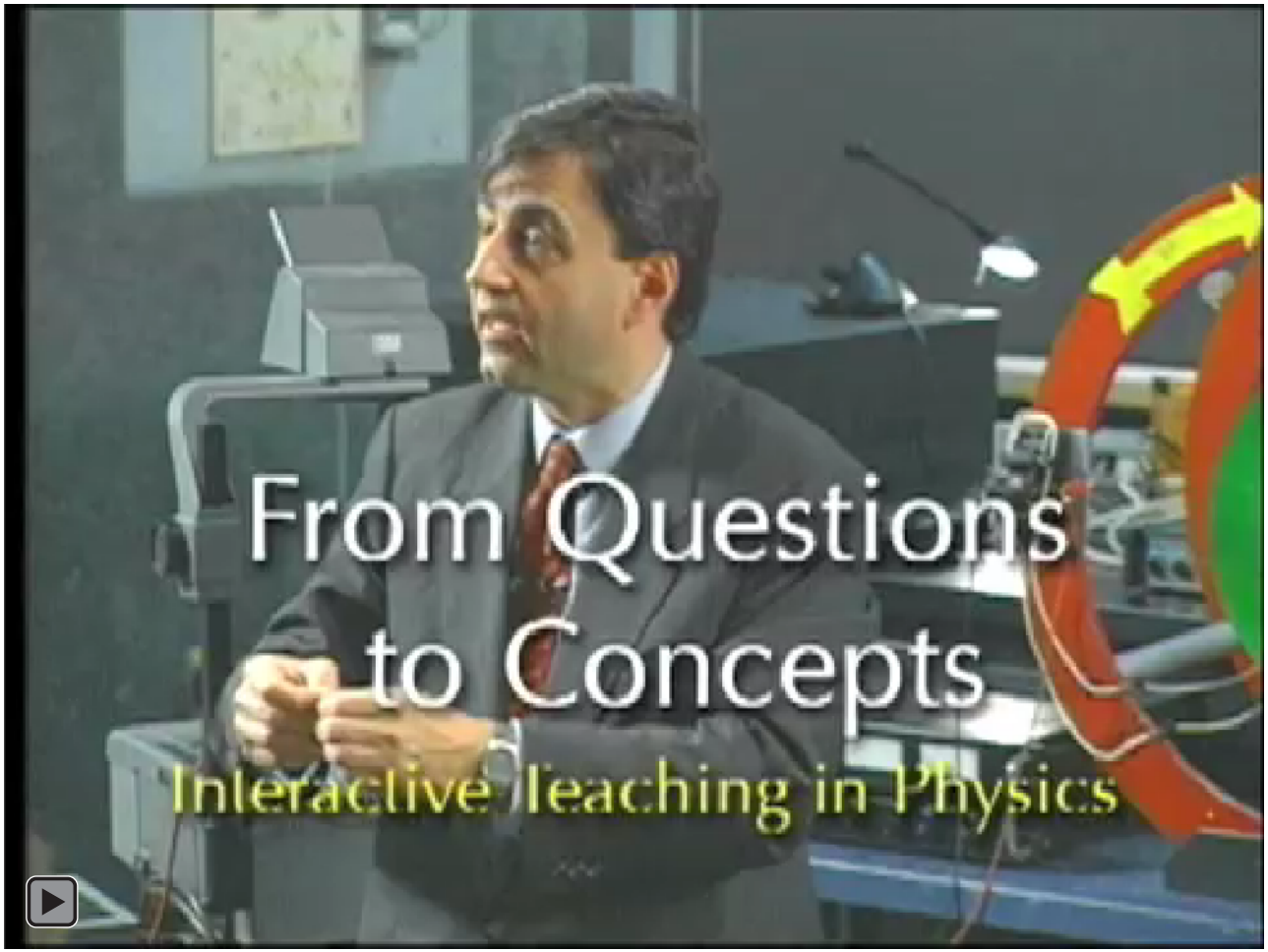
Teachers introduce new material to students.

New material is introduced to students outside of class as their homework.

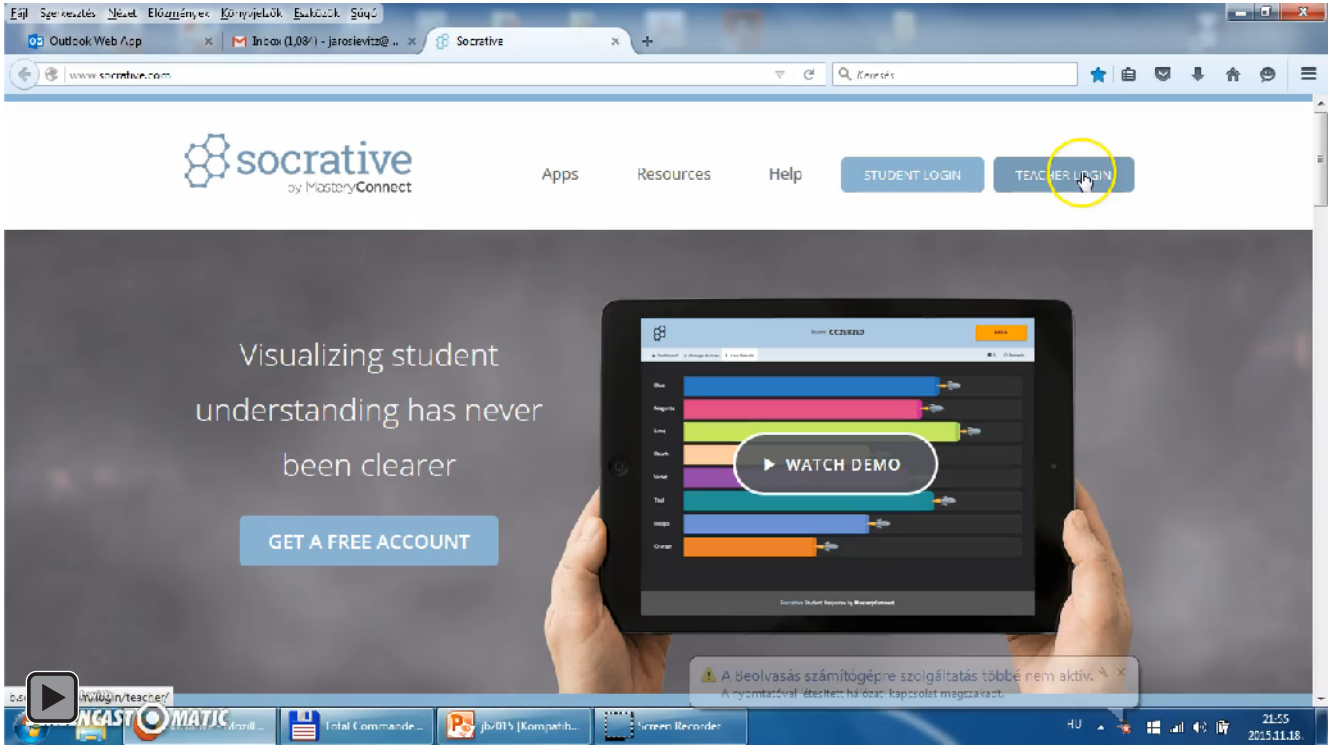
socrative
by MasteryConnect

Blooms Taxonomy *Source*

5. Applied research methods



5. Applied research methods



BYOD and turn to your neighbours

5. Applied research methods

5.2. Skills Survey (TEST)

(From various chapters of Physics)

- during the semester, 5 times,
- with own devices (BYOD),
- TURN TO YOUR NEIGHBOUR!
- using socrative by MasteryConnect
- 10 questions/each test.

5. Applied research methods

5.2 Skills Survey (TEST) *Results*

Date of the survey	Total participants during the lectures	Survey filled by participants	Results reached by the group
23. 02.2016.	45 (66,17 %) FT	27 (39,70 %) FT	35 %
08.03.2016.	24 (35,29 %) FT	20 (29,41 %) FT	48,5%
05.04.2016.	18 (26,47 %) FT	14 (20,58 %) FT	25%
26.04.2016.	21 (30,88 %) FT	19 (27,94 %) FT	41,6 %
13.05.2016.	16 (23,59 %) FT	14 (20,58 %) FT	40,8 %
13.05.2016.	**30 (25 %) DT**	**25 (20,83%) DT**	**49,9 %**

5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

Example

socrative by MasteryConnect

Quiz name: Teszt4_aprilis19
Question with Most Correct Answers: #4
Question with Fewest Correct Answers: #6

Date: 04/26/2016
Total Questions: 10

1. Egyik autó kötéllel vontatja a másikat. Óvatos indulással a vontatott jármű akármilyen sebességre gyorsítható. Hirtelen indulásnál a kötél mégis elszakad. Miért? (A súrlódástól tekintsünk el.)

3/19	A	A vontatott kocsi csak kis gyorsulással indulhat, mert viszonylag nagy a tömege.
5/19	B	Adott impulzusváltozást rövidebb idő alatt csak nagyobb erő képes létrehozni.
7/19	C	A vontatott autó adott sebességváltozásához hosszabb idő kell.
2/19	D	A kötél szakítószilárdsága függ a vontatás sebességétől.

5. Applied research methods

5.2 Skills Survey (TEST) *(results)* Example

Egyenes vonalu mozgasok. (2015
Tuesday, February 23 2016 02:40 PM
Room: f862bde5

Common Core Tags:

Student Names	Total Score (0 - 100)	Number of correct answers	Melyik mértékegységcsoport ban találhatók csak SI mértékegységek?	Egy jármű két város között odafelé 60 km/h, visszafelé 40 km/h átlagsebességgel haladt. Mennyi az oda-vissza útra számított átlagsebessége?	Egy jármű két órán keresztül 60 km/h, majd újabb két órán keresztül 40 km/h átlagsebességgel haladt. Mennyi a teljes útjára számított átlagsebessége?	Egy jármű lassít. Melyik állítás igaz?	Egy folyón úgy evezünk át a túlsó partra, hogy végig a folyás irányára merőlegesen evezünk. Melyik állítás igaz?	Egy folyón a legrövidebb úton szeretnénk átjutni. A folyás irányához képest milyen irányban kell eveznünk?	Egyenletesen gyorsuló mozgást végző test esetében az egyes másodpercekben megtett utak úgy aránylanak egymáshoz, mint a	Egy csónakban állandó erővel evezve ugyanazt a távolságot megtesszük oda-vissza először állóvízben, majd folyóvízben. Melyik állítás igaz?	Milyen magasra repült az a függőlegesen feldobott kő, melynek sebesség-idő grafikonja látható?	A grafikon egy egyenes vonalú pályán mozgó jármű sebesség-idő grafikonja. Mekkora utat tett meg a jármű a 10 másodperc alatt?
Student names disabl	20	2	g, s, cm, A, (fok)C	50 km/h	50 km/h	A sebesség és a gyorsulás egyirányú, mindkettővel ellentétes irányú az elmozdulás.	A legrövidebb úton jutunk át.	A folyásirányra merőlegesen.	páros számok.	Állóvízben rövidebb ideig tart az utazás.	30 m	60 m
Student names disabl	20	2	kg, A, m, K, s	46 km/h	52 km/h	A sebesség és az elmozdulás egyirányú, mindkettővel gyorsulás.	és folyás irányaitól.	A folyásirány és az evezésirányának között van.	egész számok	utazás.	30 m	80 m
Student names disabl	40	4	g, s, cm, A, (fok)C	50 km/h	50 km/h	Az elmozdulás és a gyorsulás egyirányú, mindkettővel ellentétes irányú a sebesség.	A legrövidebb idő alatt jutunk át.	A folyásirányra merőlegesen.	prímszámok.	Az evezés sebességétől függ, hogy melyik esetben rövidebb az utazás.	5 m	75 m
Student names disabl	30	3	kg, A, m, K, s	52 km/h	50 km/h	A sebesség és az elmozdulás egyirányú, mindkettővel ellentétes irányú a gyorsulás.	A legrövidebb úton jutunk át.	A folyásirány és az evezésirányának szöge 0o és 90o között van.	prímszámok.	Folyóvízben rövidebb ideig tart az utazás.	30 m	80 m
Student names disabl	10	1	g, s, K, m, A	50 km/h	52 km/h	A sebesség és az elmozdulás egyirányú, mindkettővel ellentétes irányú a gyorsulás.	A legrövidebb úton jutunk át.	A folyásirányra merőlegesen.	egész számok	Az evezés sebességétől függ, hogy melyik esetben rövidebb az utazás.	30 m	60 m
Class Scoring	34,4%	3,44	37,0%	3,7%	88,9%	55,6%	22,2%	14,8%	3,7%	37,0%	48,1%	33,3%

5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

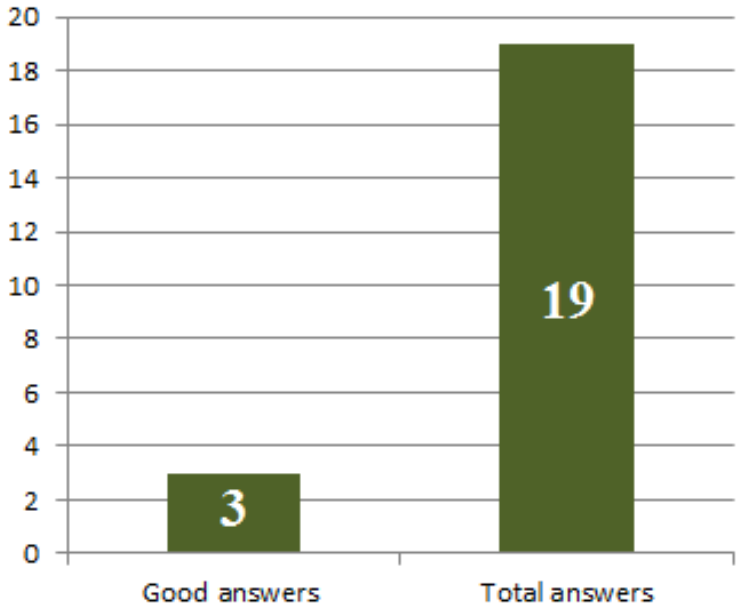
Which statement is true for a perfectly inelastic collision?

a) only the momentum is conserved

b) only the energy is conserved

c) both the momentum and the energy are conserved

d) none of the momentum and the energy is conserved



5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

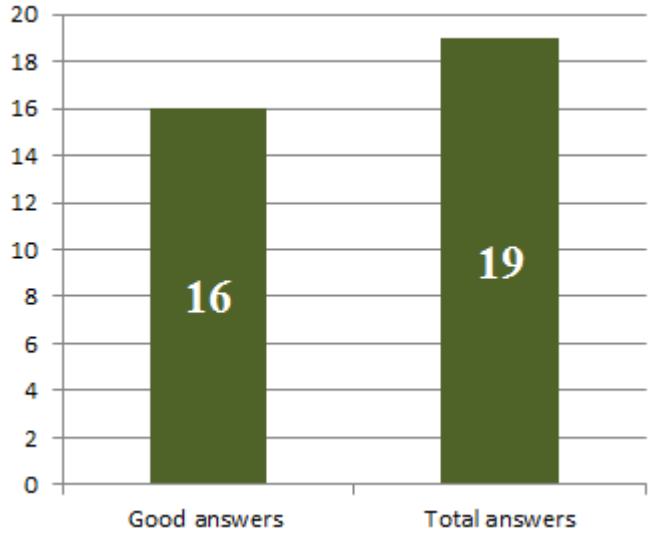
A compressed spring is placed between two trolleys of masses 200 g and 400 g respectively. They are in equilibrium at this stage. When the spring is released, the 200 g trolley starts moving with a speed of 6 m/s. At what speed will move the other car?

a) 1 m / s

b) 2 m / s

c) 3 m / s

d) 6 m / s



5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

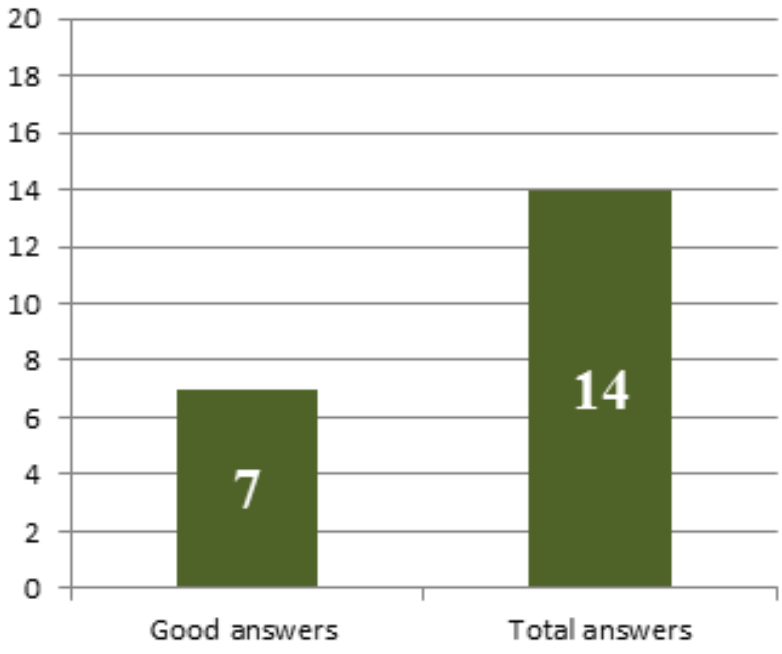
In which group are units of the SI system exclusively?

a) kg, s, °C, m, V

b) g, s, K, m, A

c) kg, A, m, K, s

d) g, s, cm, A, °C



5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

Which statement is true?

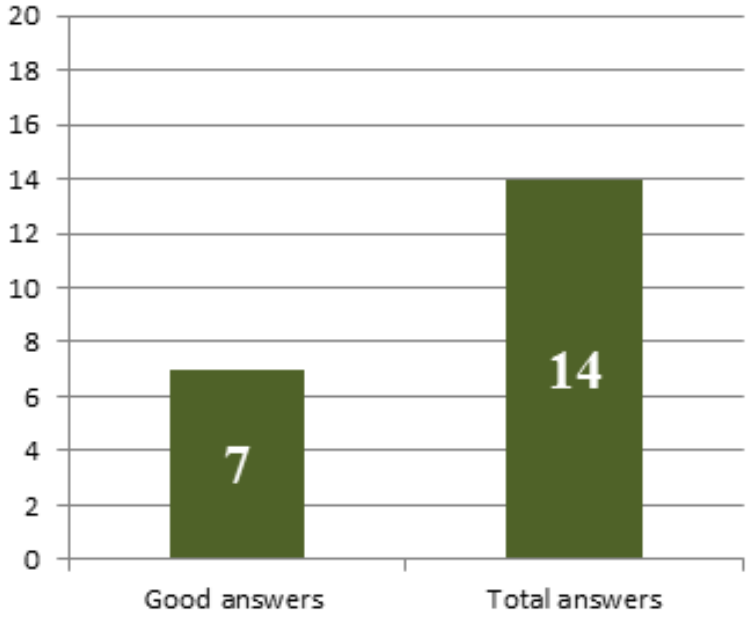
If some further quantity of the same temperature ideal gas is added to a container, then…

a) the pressure is increased.

b) the temperature is increased.

c) the pressure and the temperature increas

d) the temperature is reduced.



5. Applied research methods

5.2 Skills Survey (TEST) *(results)*

The frequency of a vibrating mass is 2 Hz.

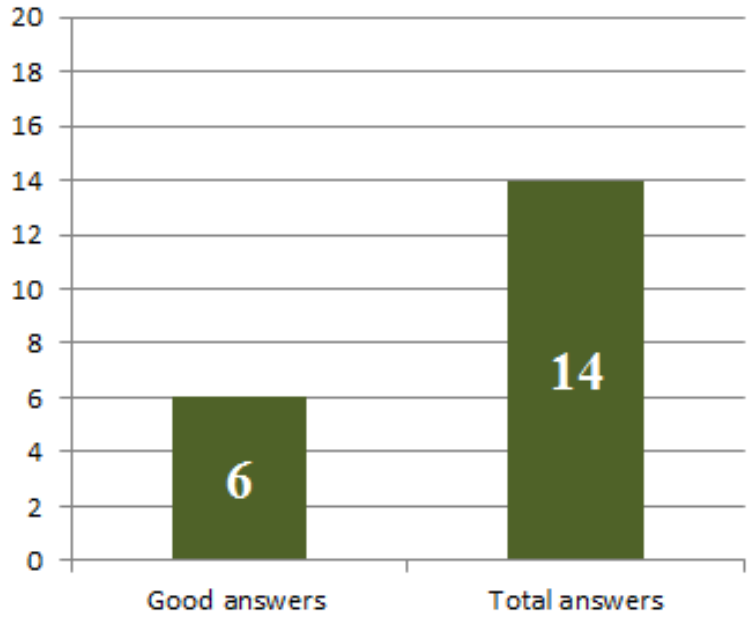
After displacing it 0,2 cm from its equilibrium state we release it.

What is the displacement after 0,125 s?

a) 0,1 cm

b) 0,2 cm

c) 0,0 cm



BYOD and turn to your neighbours

6. Results *(derived from personal interviews, students' feedback)*

Students who had joined the courses:

- **took part** in the research activity **with enthusiasm**,
- **enjoyed the experiments** made with smart phones and tablets,
- filled in the surveys with pleasure,
- **cooperated with their neighbours** „Turn To Your Neighbours" (*Mazur , 2014; Le Roux , 2013*),
- **were motivated** in problem solving, and thinking,
- **used their own devices** with expertise,
- students **like to talk face to face** with the teachers.

7. Summary and Conclusions

Problems are the following:

Students:

- have **not really attended the lectures** (only: 20-30%),
- **were confident** (**erroneously**) that the material can be learnt in a short time,
- **did not have enough basic knowledge** from their previous study.

ICT + use of OD is not enough to study and learn Physics!

Future plans. Promotion of Physics, prepare and do experiments, motivate students to use their own devices for study, measurements and experiments!

Students' attitude to Physics should be changed!

BYOD and turn to your neighbours

8. References

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BYOD and turn to your neighbours

„The future cannot be predicted,

but futures can be invented”.

Dennis Gabor

DENNIS GABOR: Nobel prize winner for holography: 1971

Thank you for your attention!