Experiences in teaching game theory in the high school

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Work place: St. Emeric Catholic High School, Primary School, College , Kindergarten and Elementary School of Arts in Nyíregyháza

The place of the research: NYEKLG

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Preludes

The models were tested in real or staged conditions.

The group of targets are high school students; in split classes.

To understand the social structures I used the methodology of game theory.

OUTLINE OF PRESENTATION

Research

Experiments

Experiences

Future plans

Research

Basic supposition:

the students do not, or incorrectly know the game theory.

Research

Goal : Mapping relationships

Examined areas:

- the place of the concept
- place among the sciences
- mathematical relationships
- game theory in physics

Research

Sampling

The number of respondents (92 persons)

+

Composition (primary school age: 35 persons; secondary school age: 57persons)

+

method (marking of links between elements)

Research

the place of
the concept

game theory

gaming

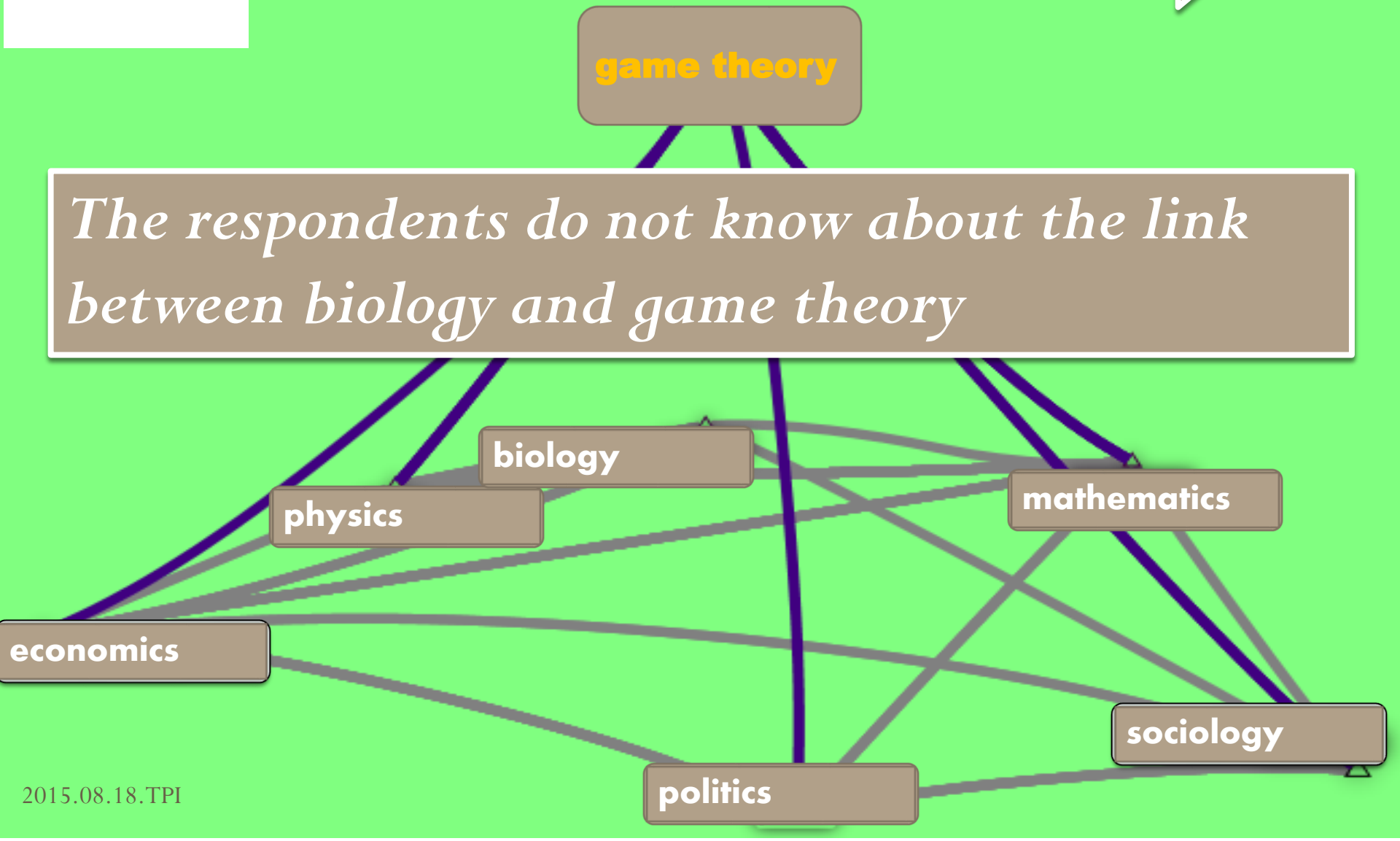
toy

rounders

The respondents were indicated the contact with each of the concepts

Research

place among the sciences

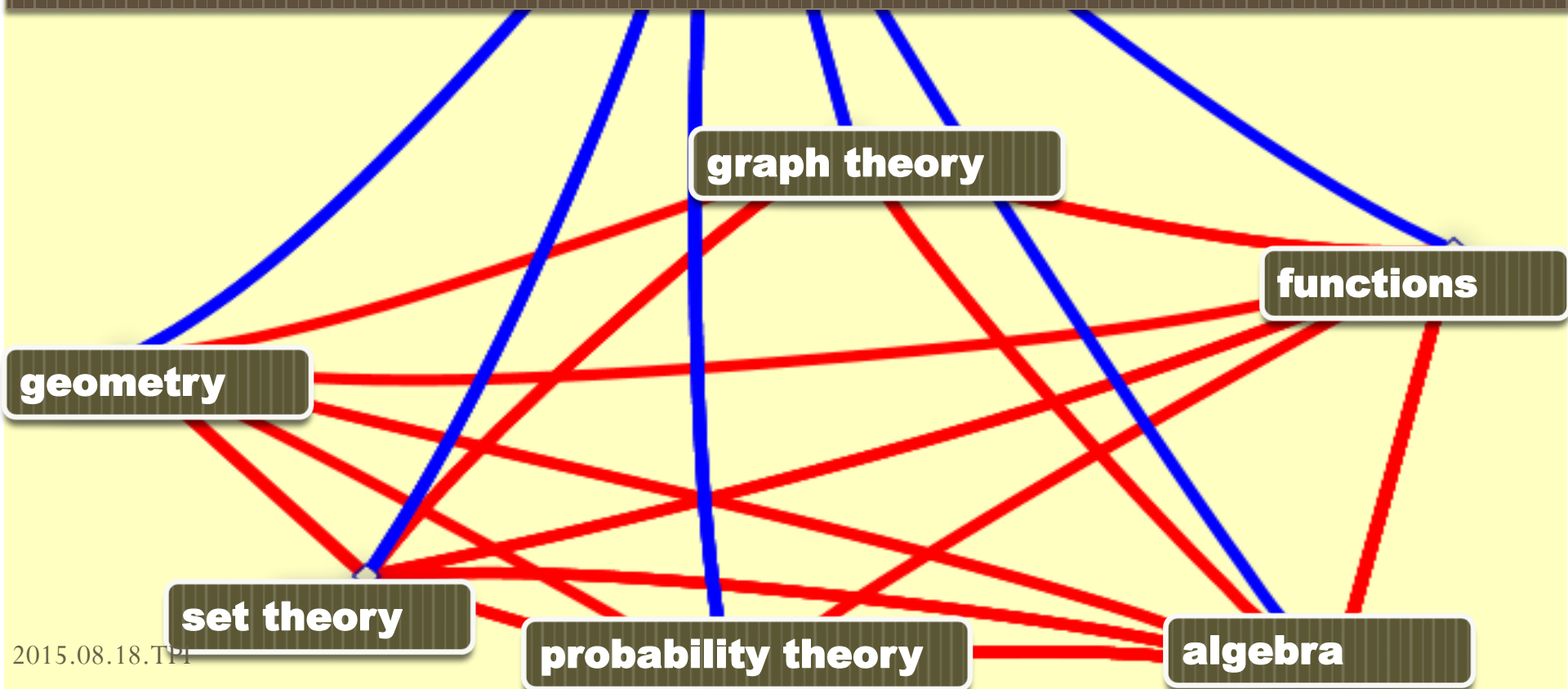


The respondents do not know about the link between biology and game theory

Research

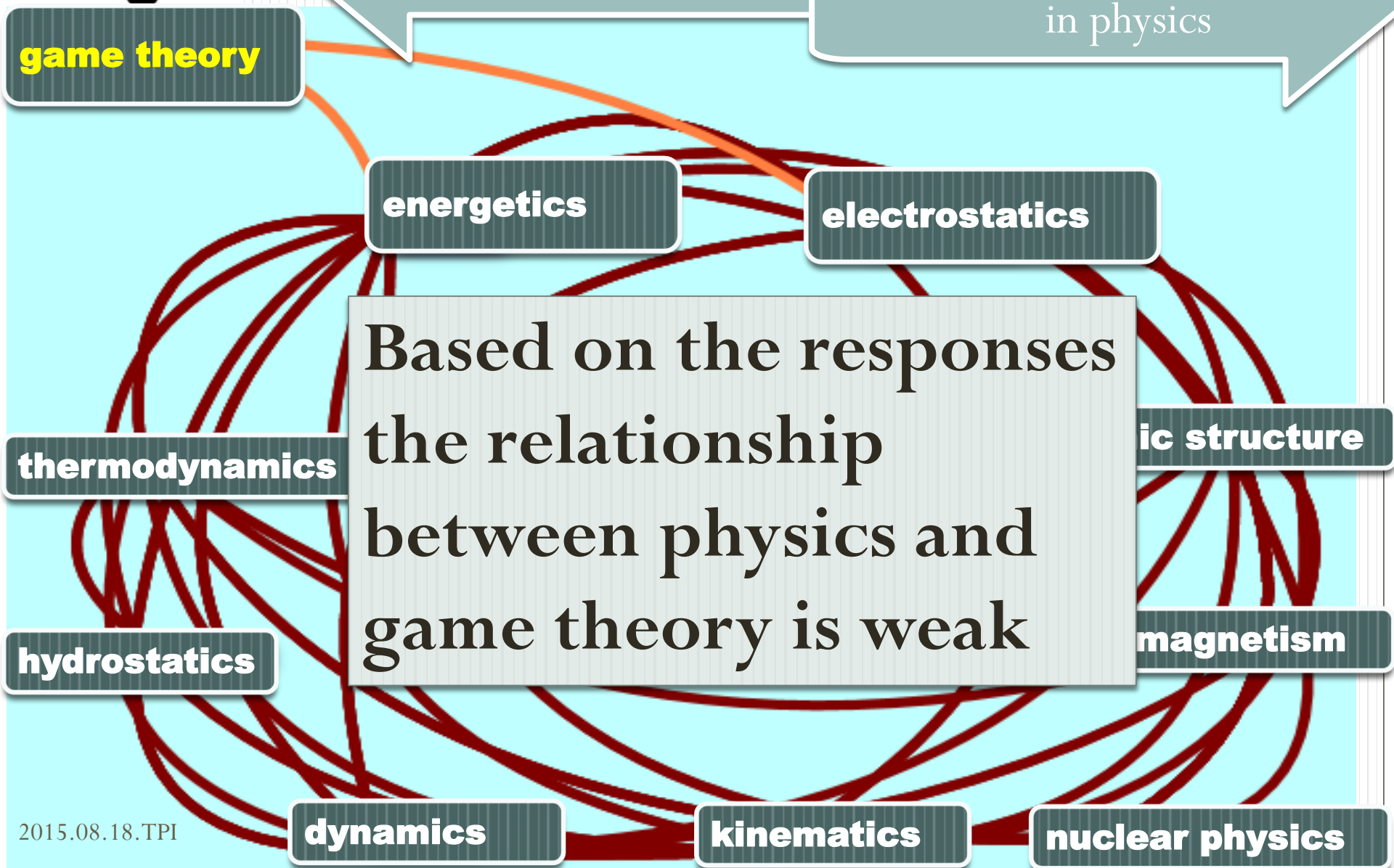
mathematical relationships

Respondents found a link between the game theory and some branches of the mathematics



Research

Game theory in physics



Based on the responses the relationship between physics and game theory is weak

Conclusion:

The concept of science is uncertain in the conceptual system of young people;

The lack of biological relation warns us on basic ignorance

The game theory and the physics are requires a better understanding

Experiments

Living Situation

Number of participants: 57 persons

Method: Questions, closed-end responses, short response time

Target of inspection: How unselfish are young people?

Experiments

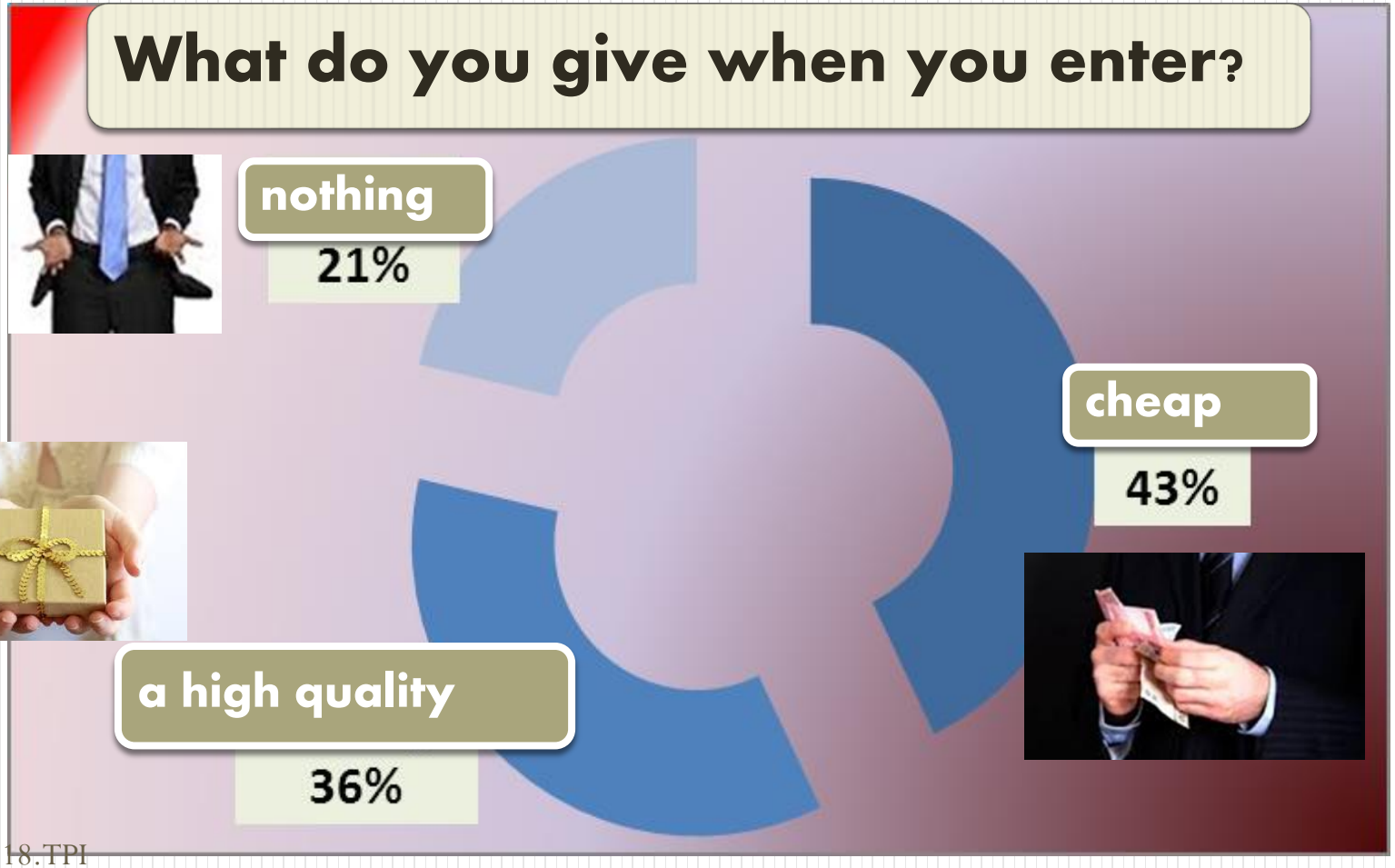
BASIC SITUATION:

You are about to party, on which a part of the consumption is included of the ticket . Besides, you can bring offerings for the occasion , which you give when you enter, when you showing off your tickets,

and they share it among the guests.

Experiments

First / a



BASIC SITUATION:

/Similar to the first/

You are about to party, on which a part of the consumption is included of the ticket . Besides, you can bring offerings for the occasion , which you give when you enter,

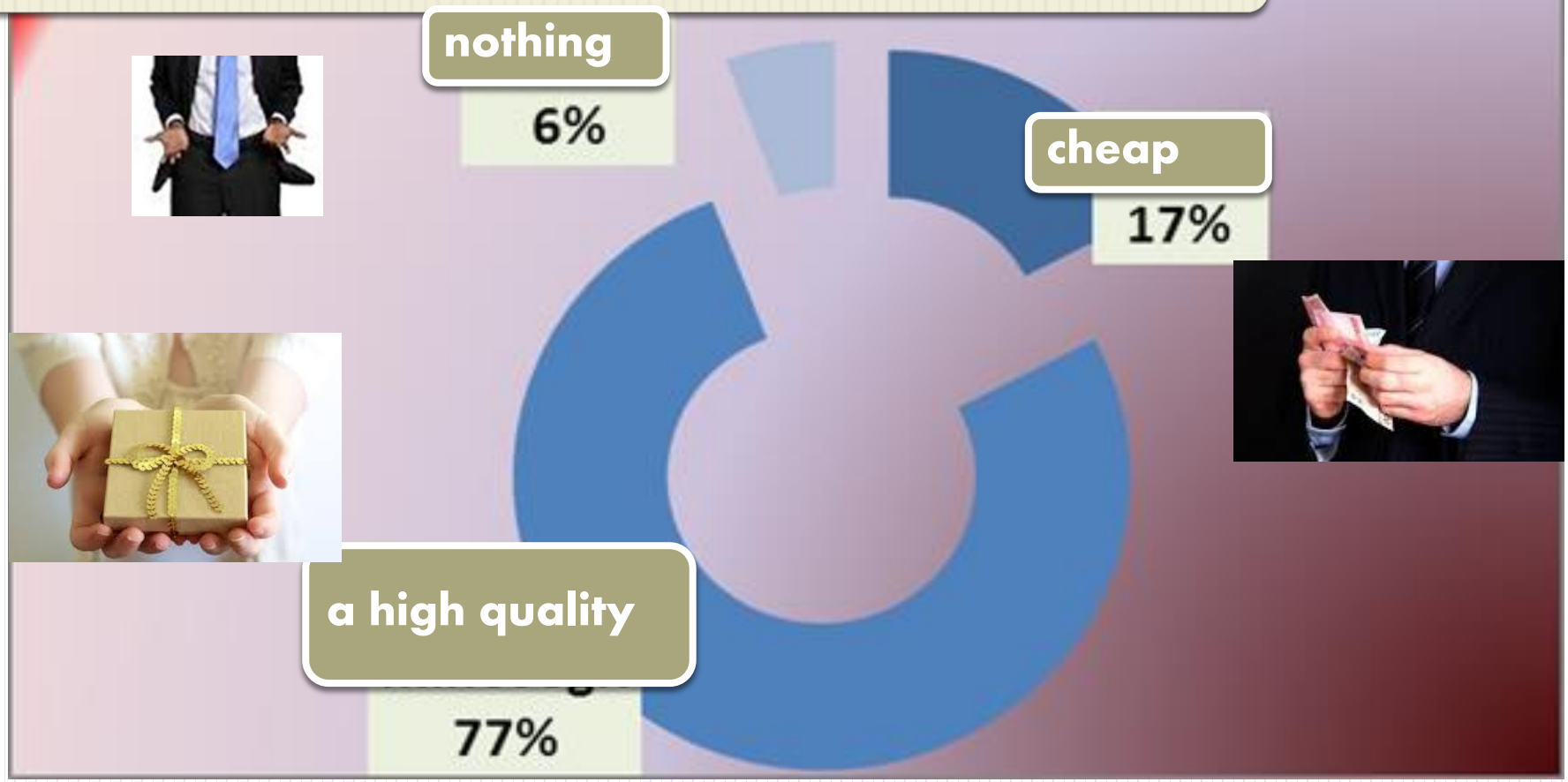
and they bring it to the table at which you sit , and during the evening they serve the table company with this.

Experiments

Experiments

First / b

What do you give when you enter?



Conclusion:

One third of young people are unselfish,

and about a fifth is doing parasitic behavior

Living Situation

Number of participants:
74 persons

Method: Questions, closed-end responses, short response time

Target of inspection:
How responsible are young people?

BASIC SITUATION:

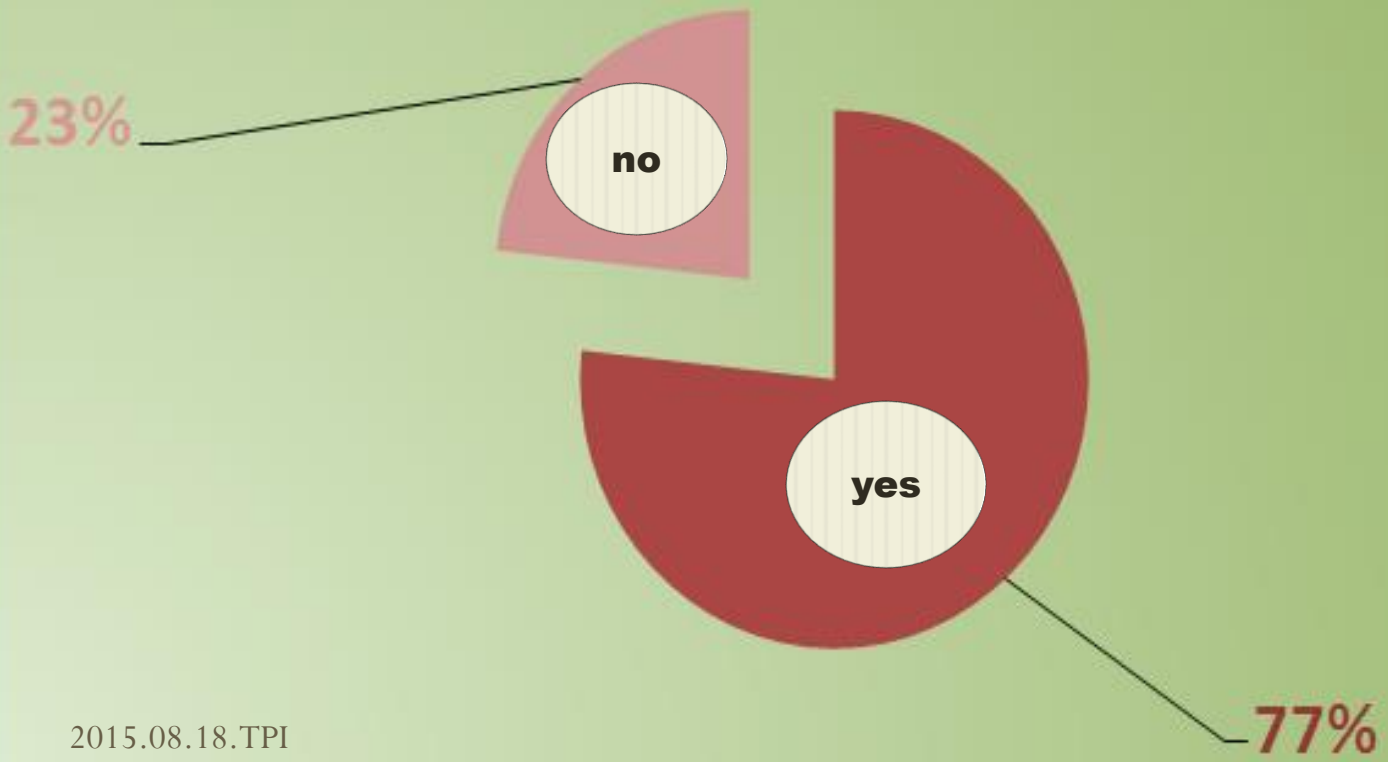
Experiments

Test writing is coming on which you are not prepared . Entering the room, a classmate gives you a cheat sheet, which contains his name on it. He asks you to search him at the end of the lesson , and give him it back, because he will need it yet .

If the teacher catches you out cheating ,
takes it away,
and you can continue the work.

Experiments *first / a*

Are you going to use the cheat sheet?



BASIC SITUATION:

/Similar to the first/

Experiments

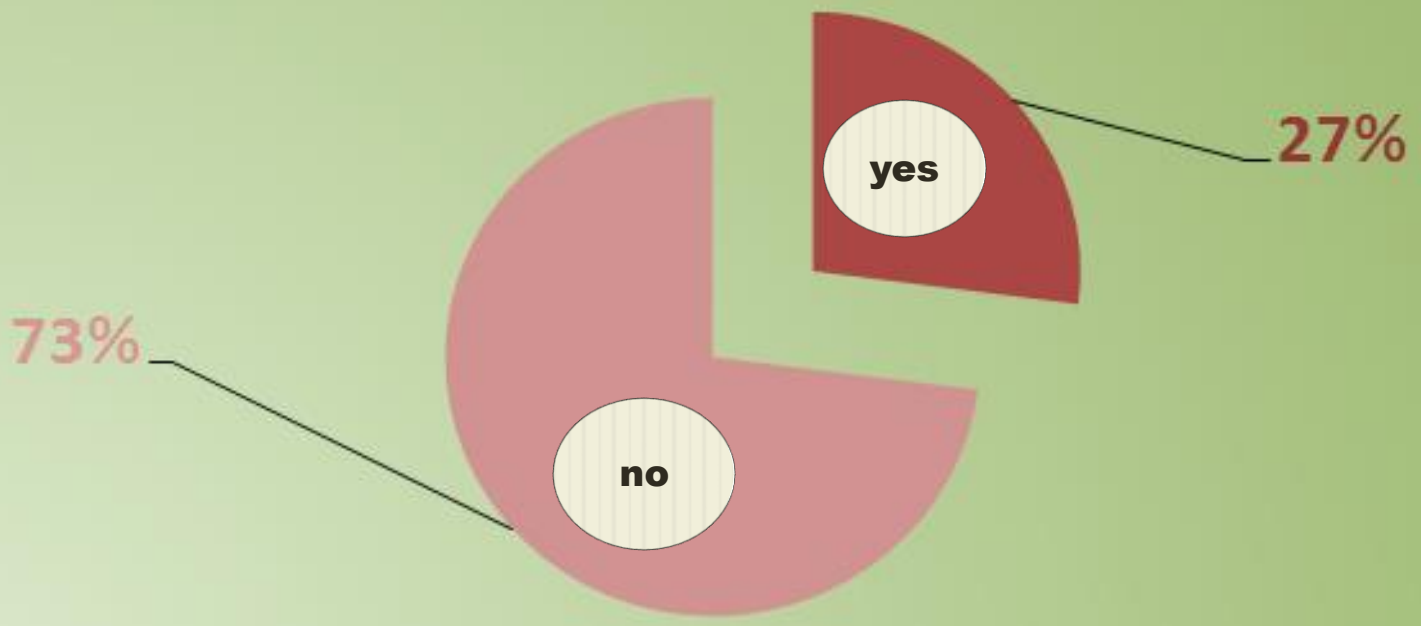
Test writing is coming on which you are not prepared . Entering the room, a classmate gives you a cheat sheet, which contains his name on it. He asks you to search him at the end of the lesson , and give him it back, because he will need it yet .

If the teacher catches you out cheating ,
takes it away, and sends you to the director

Experiments

second/b

Are you going to use the cheat sheet?



BASIC SITUATION:

Experiments

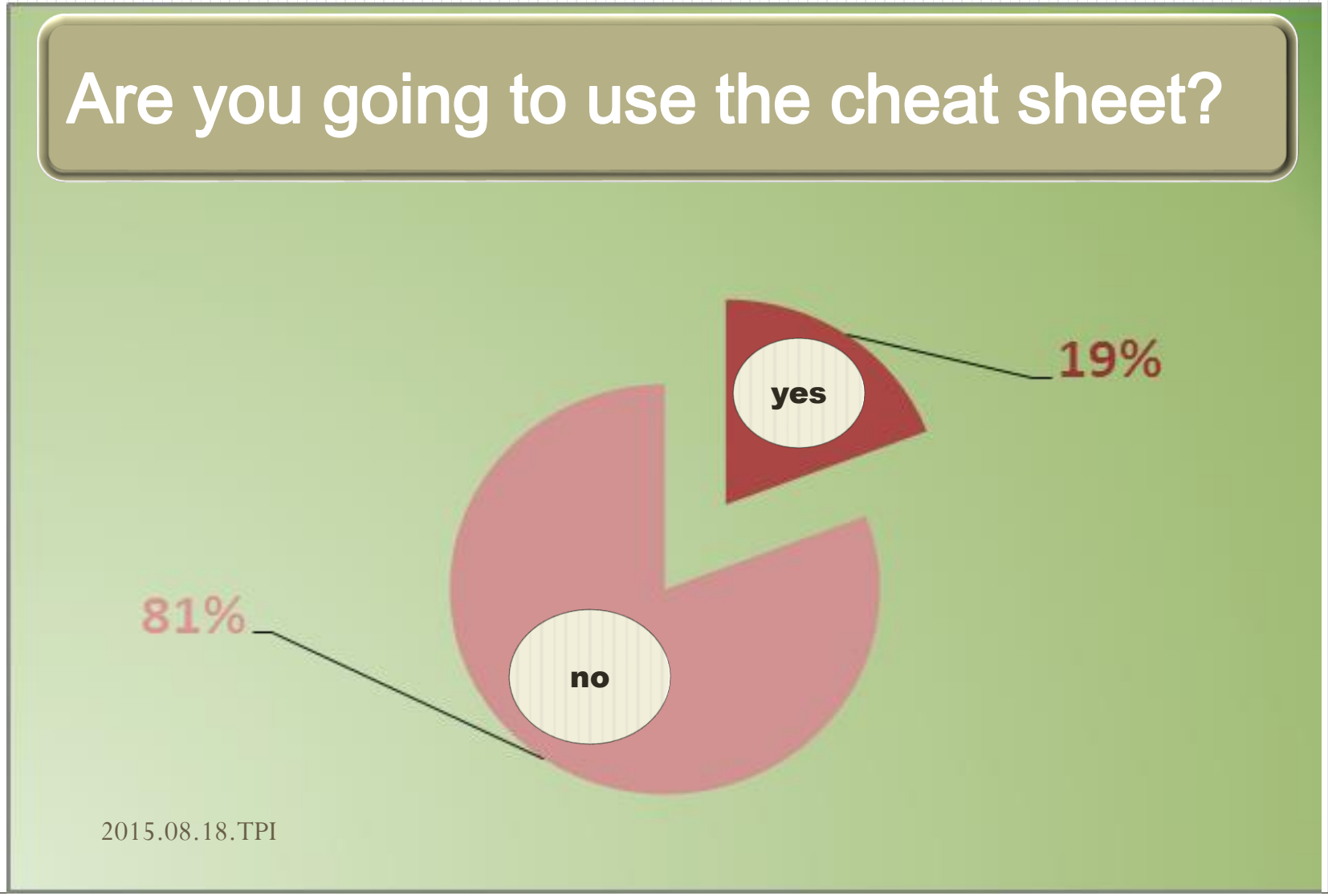
/Similar to the first/

Test writing is coming on which you are not prepared . Entering the room, a classmate gives you a cheat sheet, which contains his name on it. He asks you to search him at the end of the lesson , and give him it back, because he will need it yet .

If the teacher catches you out cheating,
takes it away, and sends you and the maker of the cheat sheet to the director

Experiments

third/c



Conclusion:

Without punishment the behavior is irresponsible

The growth of the weight of consequence increases the sense of responsibility

The co-responsibility is important

Students have mastered the basic concepts of game theory:

Player

Game

Dilemma decisions

Possible strategies

Decision chart

Applied to the possible modes of representation:

matrix

graph

Living Situation

Number of participants:
74 persons

Method:
real life situations to test, and to analyze

Applying: graphs, matrices, charts

Sugar Salon game

Experiments

1. player		
2. player	puts	remove
puts:	2 2	0 3
remove	3 0	1 1

- **Players**
- **Possible strategies**
- **Decision chart**

work by the students of the NYEKLG

Repetition

work by the students of the NYEKLG

Experiments

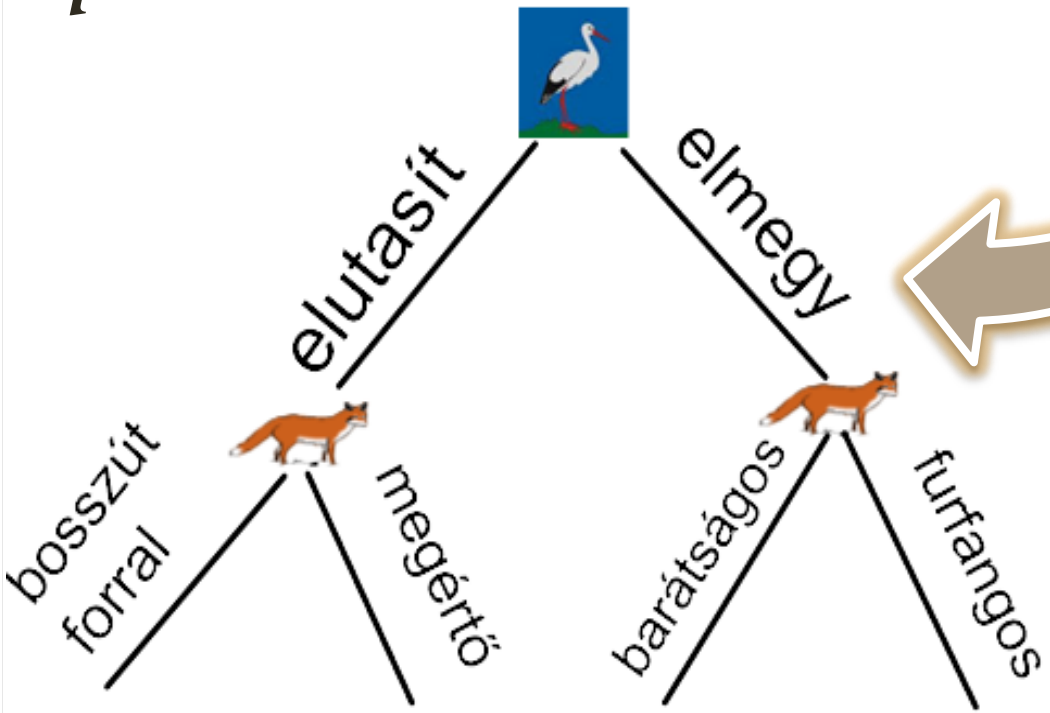
- Players : Respondent and Questioner
- Dilemma of decisions: asks, doesnt answ , answers…
- Decision chart

	Respondent		
	answ		does not comply
Questione	do not ask	0 1	0 0
	asks	1 1	0 0

One fable: „One day the fox invited the stork to be a guest”

matrix *and* ***graph*** *form*

Experiments



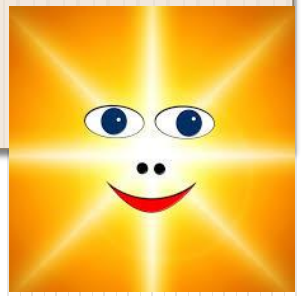
		
	elmegy	elutasít
	barátságos	megértő
	furfangos	bosszút forral

Conclusion:

The analysis of situations in life are quite good

Students apply the matrix form with pleasure

Analysis of the fable is time-consuming, but it is instructive and enjoyable



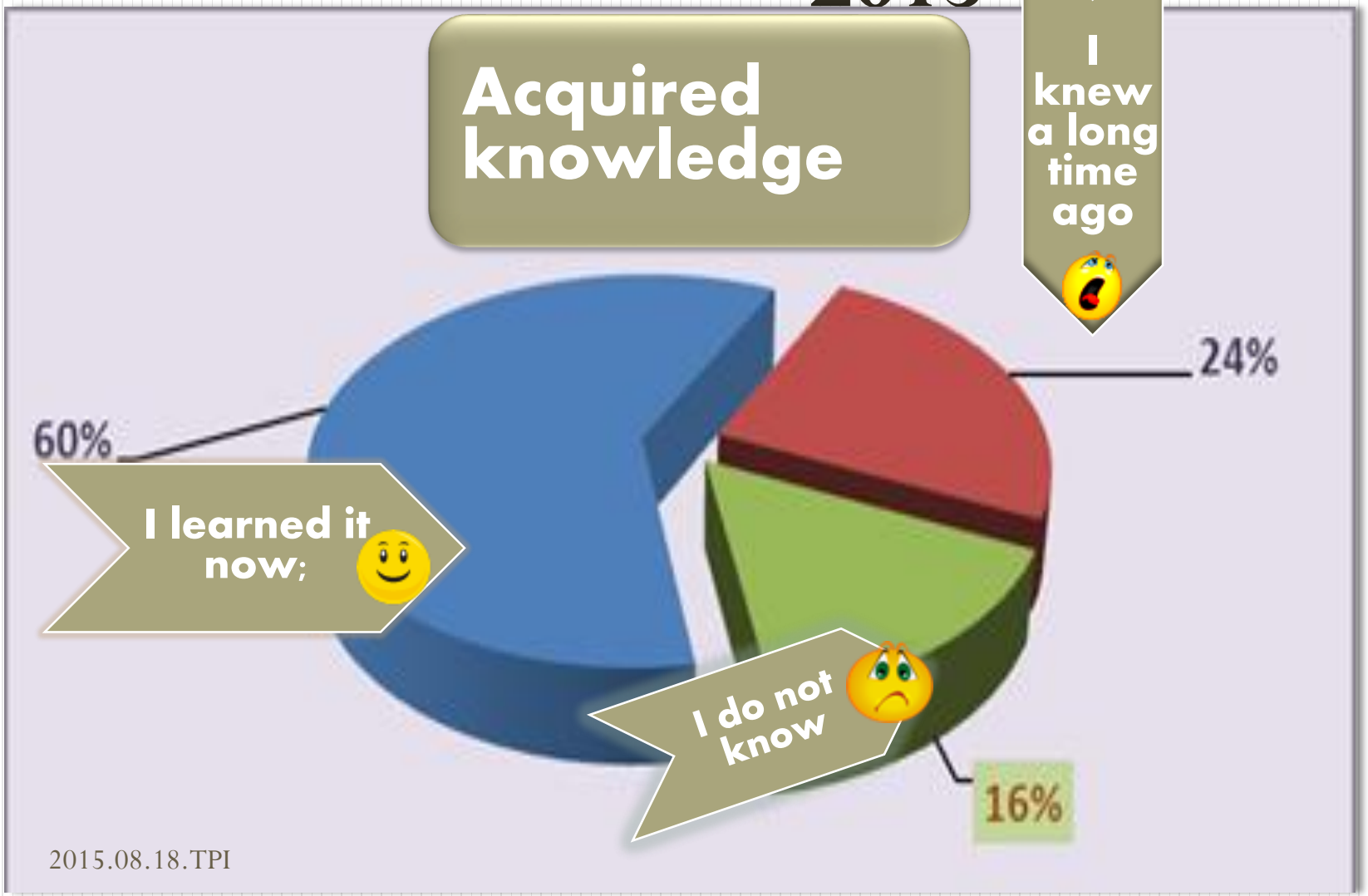
Experiences

Number of respondents: 47 persons

Method:
interviews;
Closed-ended questionnaire, report

Purpose:
To determine the level of acquired knowledge

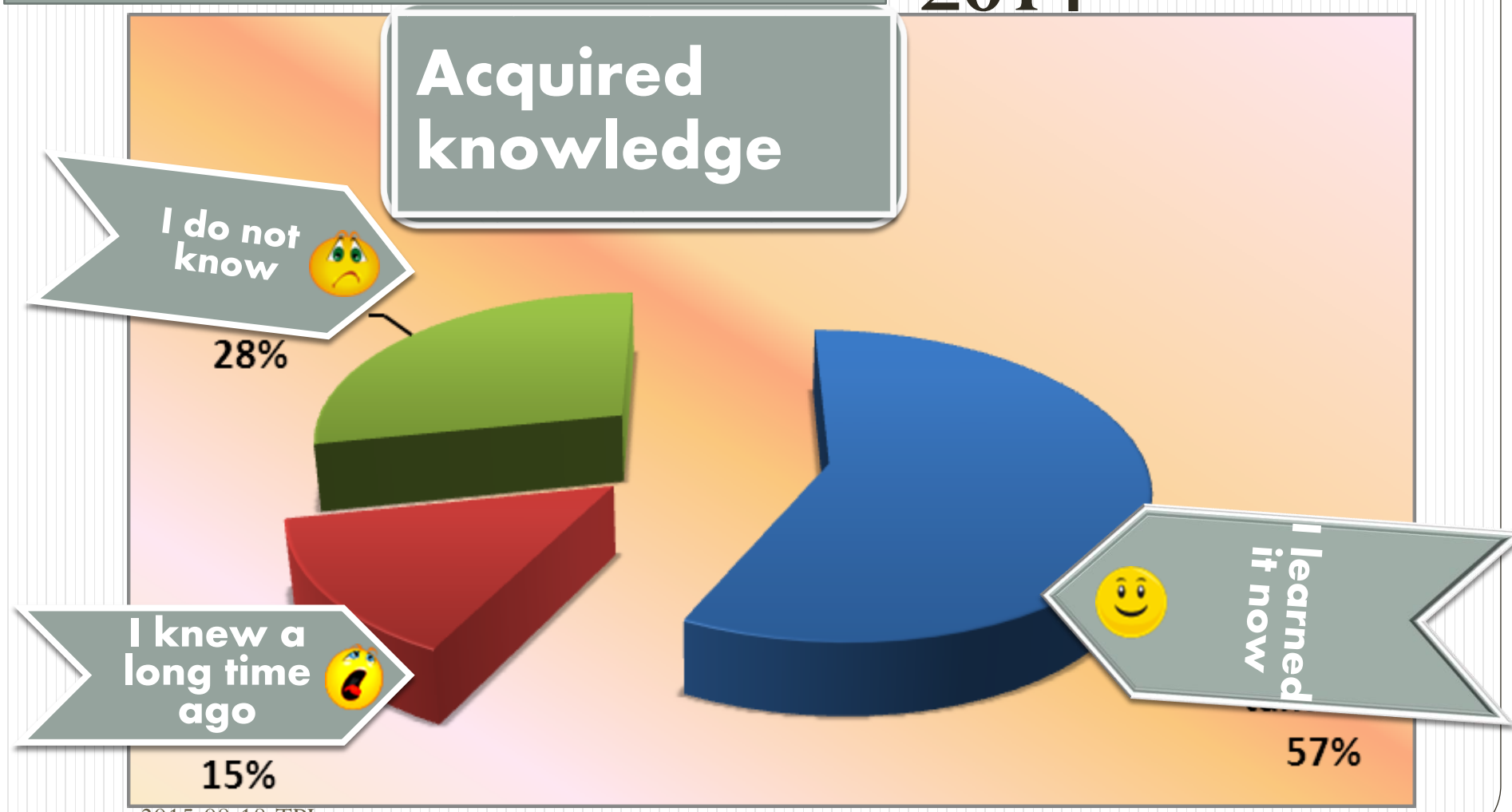
Experiences 2013



one year later

Experiences 2014

ICT-supported processing



Conclusion:

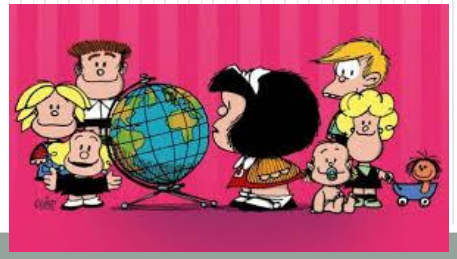
The students learned a significant part of the processed topic

The topic contained known parts in a small part

The data processing do not show a significant difference in topic processing

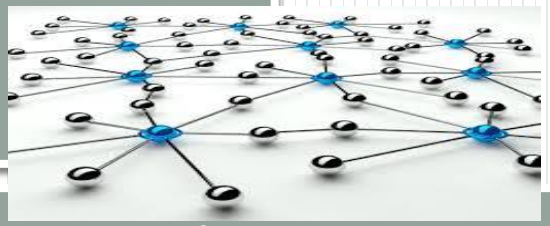
Future plans

Future plans



The foundations of game theory outside the classroom, with students interested in process;

To incorporate the basic network concepts;



Game theory and the science of physics approximation

I am grateful for

Thanks giving

My son: Áron Leitner

My husband

My students

My consultant: György Szabó

Thank you very much for your attention

Resources:

[1]http://antikregiseg.hu/mesetar/ 2014. március 31.
[2] Tóth I. János: Játékelmélet és társadalom [JATEPress, Szeged, 1997].
[3] Filep László: Játékelmélet, [Tankönyvkiadó Vállalat, Budapest, 1985].
[4] Tóth Zoltán: A tudásszerkezet és a tudás szerveződésének vizsgálata a tudástér-elmélet alapján [Magyar Pedagógia, 2005]
[5] K. Sigmund: The Calculus of Selfishness [Princeton University Press, Princeton, MA, 2010].
[6]Neuman János: A számítógép és az agy [Gondolat kiadó, Budapest,1960]
[7] Radnóti Katalin – Nahalka István: A fizikatanítás pedagógiája [Nemzeti Tankönyvkiadó, Budapest, 2002]