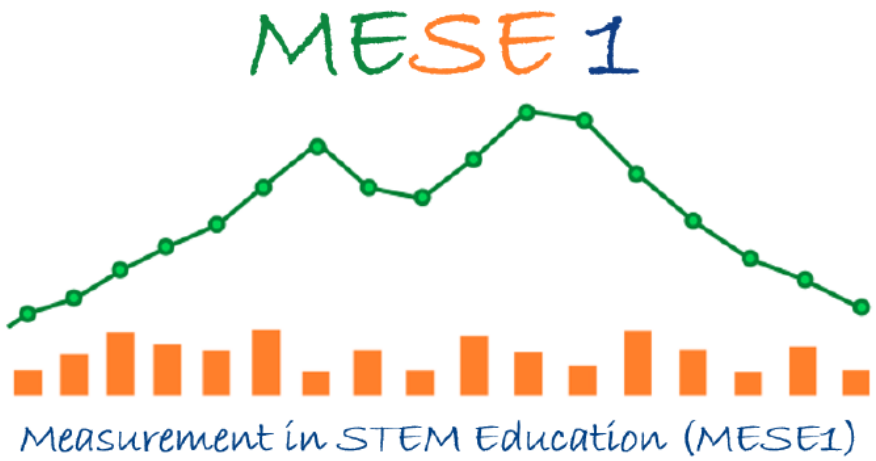

DISP Dipartimento di Scienze Politiche Università degli studi di Napoli Federico II

Università degli Studi di Napoli Federico II - Dipartimento di FISICA "ETTORE PANCINI"

Naples 30,31 January, 1 February

AN EXTENSIVE QUESTIONNAIRE ABOUT EMERGENCY REMOTE TEACHING: MORE THAN 3000 ENGINEERING STUDENTS RESPOND ABOUT THEIR PERCEPTIONS ON ONLINE DIDACTIC ACTIVITIES

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INDEX

- The scenario
- Survey's description
- Methods
- Results
- Conclusions and discussions

THE SCENARIO

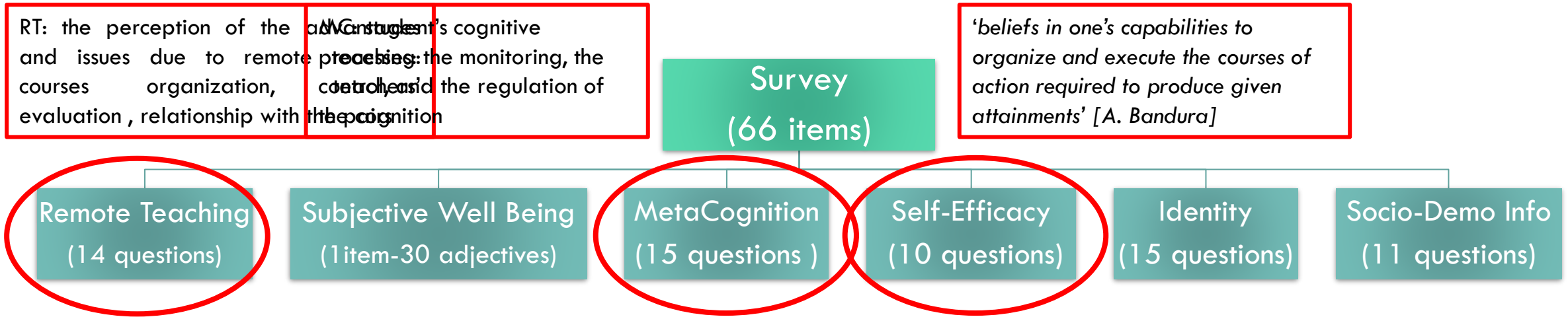
- Outbreak of COVID-19 (pandemic declaration 11 march 2020 by World Health Organization), in Italy the first lockdown on 20 February 2020
- Sudden transition from face-to-face to total remote teaching in every order of educational institutions.
- Universities reorganize the courses and improve teaching methodologies and instruments.
  - Politecnico di Milano implemented a series of targeted and systemic actions in order to support this transition
- Researchers are studying the effects of the remote teaching on students' outcomes

We proposed to all the PoliMi students an extended survey to investigate these effects

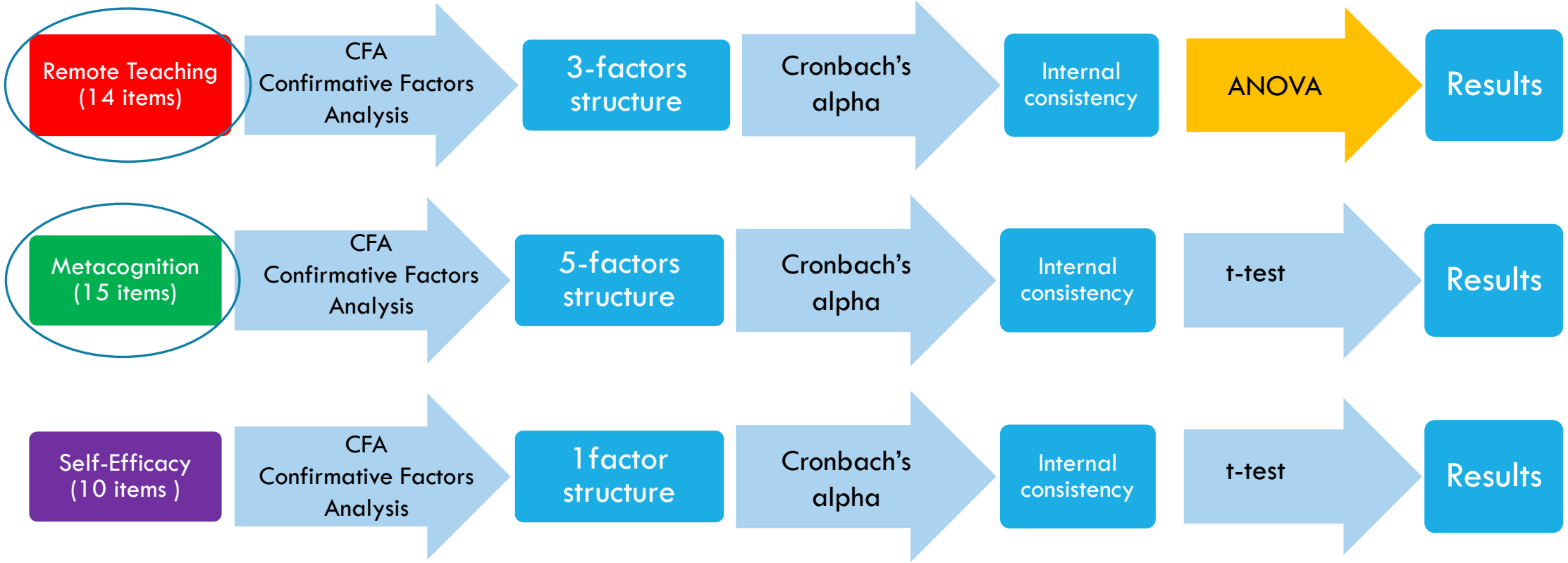
https://www.mdpi.com/2071-1050/15/3/2295

SURVEY'S DESCRIPTION

- 66 questions referring to the A.Y. 2019-2020 and 2020-2021at Politecnico di Milano
- Answers on a five point Likert scale (1-5) comparing the items PRE pandemic and during pandemic (NOW)
- Answers collected by 3920 students (3183 engineers)
- Items divided in 6 subsections as in the figure.



METHODS

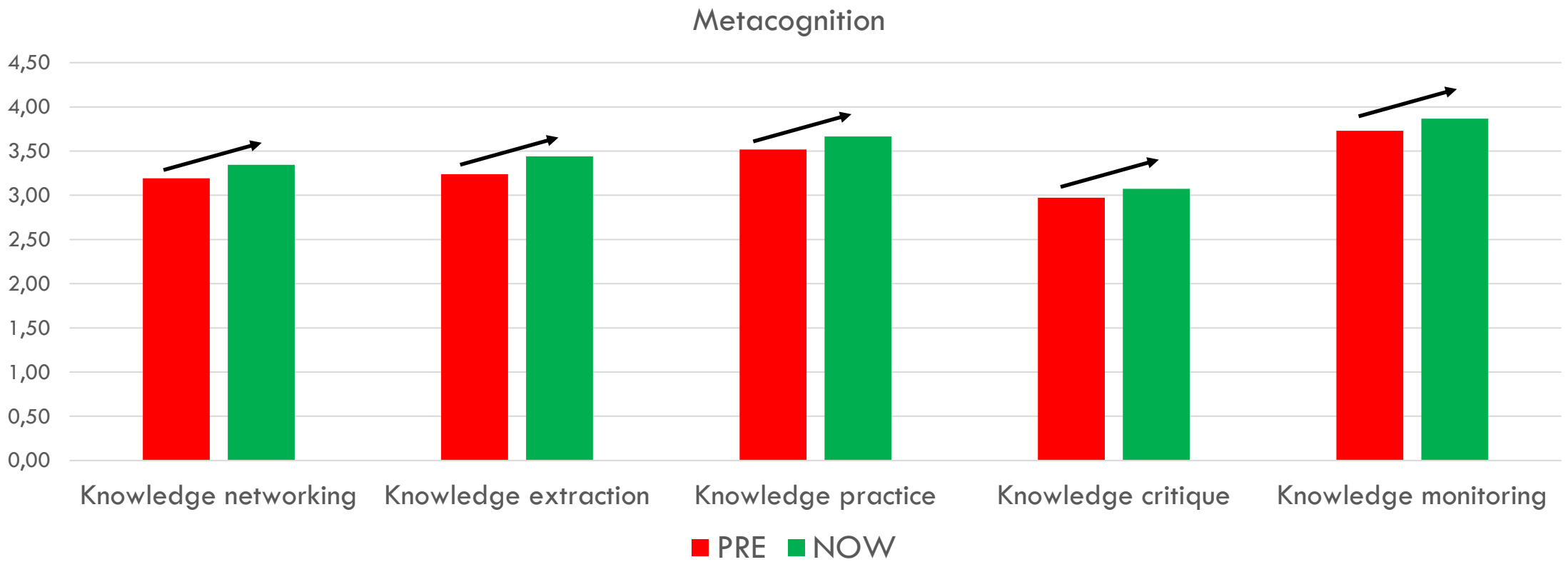

Remote Teaching (14 items)
CFA Confirmative Factors Analysis
3-factors structure
Cronbach's alpha
Internal consistency
ANOVA
Results
Metacognition (15 items)
CFA Confirmative Factors Analysis
5-factors structure
Cronbach's alpha
Internal consistency
t-test
Results
Self-Efficacy (10 items)
CFA Confirmative Factors Analysis
1 factor structure
Cronbach's alpha
Internal consistency
t-test
Results

METACOGNITION - 15 ITEMS (1/2)

Factors	PRE/NOW	Item number	Cronbach's alpha	Mean Value	SD	p-value	effect size
Knowledge networking	PRE	3	0,81(Very good)	3,192	0,896	$p << 0,001$ $(3,2 \cdot 10^{-34})$	0,22
	NOW		0,81(Very good)	3,346	0,909		
Knowledge extraction	PRE	3	0,79(Good)	3,240	1,027	$p << 0,001$ $(2,6 \cdot 10^{-44})$	0,25
	NOW		0,79(Good)	3,441	1,039		
Knowledge practice	PRE	3	0,78(Good)	3,519	0,893	$p << 0,001$ $(2,6 \cdot 10^{-29})$	0,2
	NOW		0,78(Good)	3,665	0,885		
Knowledge critique	PRE	3	0,77(Good)	2,973	0,879	$p << 0,001$ $(3,3 \cdot 10^{-16})$	0,14
	NOW		0,77(Good)	3,073	0,911		
Knowledge monitoring	PRE	3	0,79(Good)	3,729	0,790	$p << 0,001$ $(5,4 \cdot 10^{-25})$	0,18
	NOW		0,79(Good)	3,867	0,779		

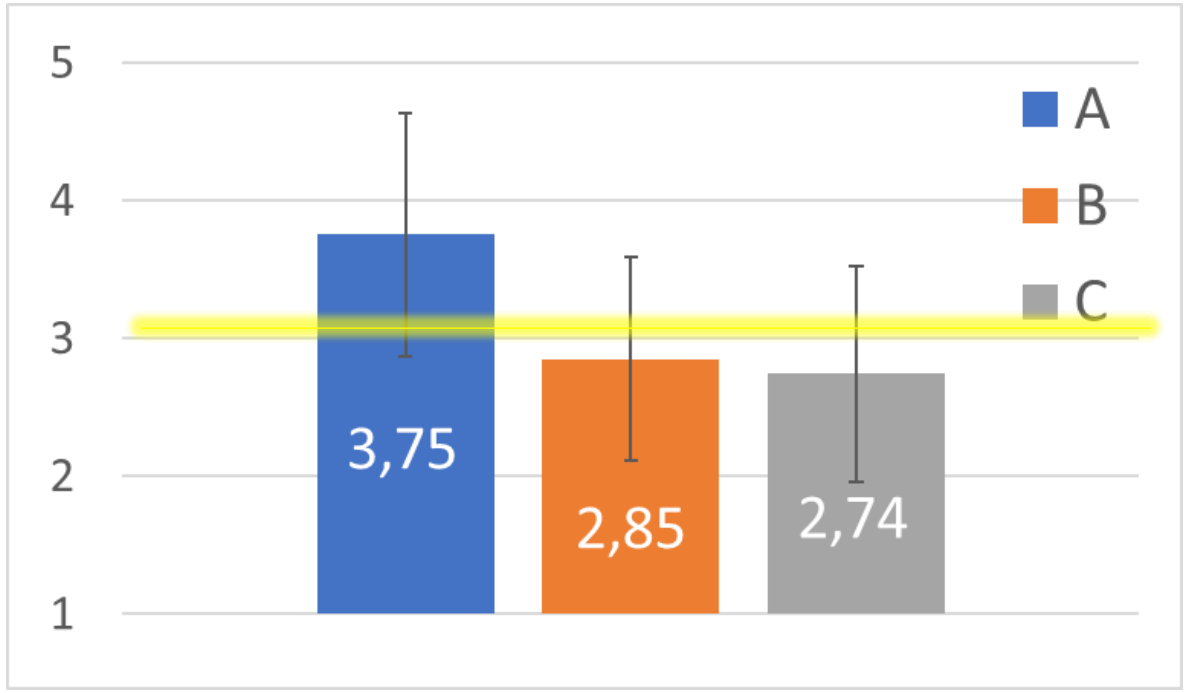
CFA consistency t-test

METACOGNITION - 15 ITEMS (2/2)



REMOTE TEACHING - 14 ITEMS (1/3)

	Factors	Items number
A	**effectiveness and organization of the course**	2 (2-3)
B	**the evaluation of the instructors**	6 (5-10)
C	**the perceived difficulties due to the transition in online learning modality**	6 (4,11-15)



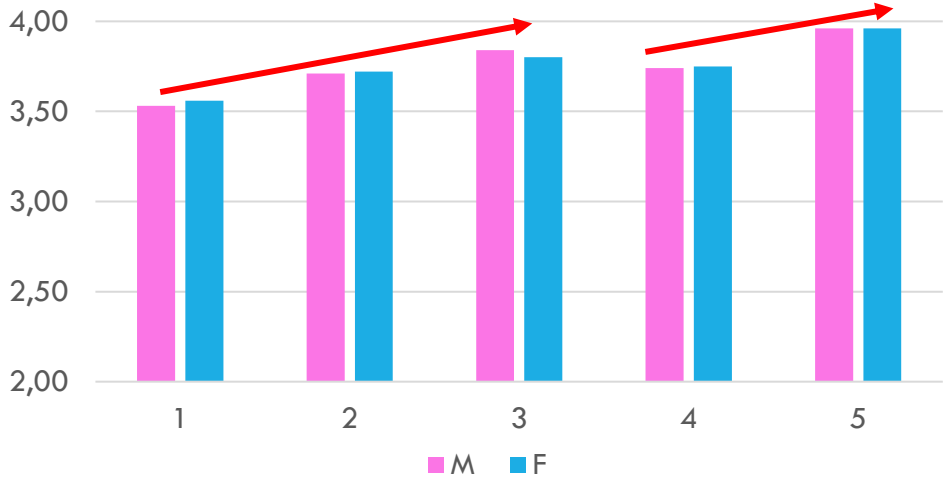
REMOTE TEACHING - 14 ITEMS (2/3)

	Factors	Items number
A	**effectiveness and organization of the course**	2 (2-3)
B	**the evaluation of the instructors**	6 (5-10)
C	**the perceived difficulties due to the transition in online learning modality**	6 (4,11-15)

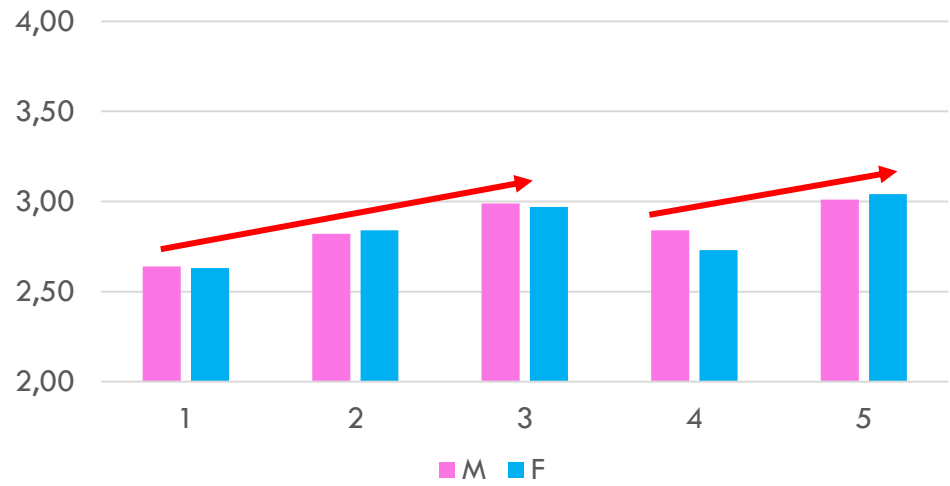
	Mean	St.Dev	Median
Q2: what do you think about remote teaching that was proposed in your courses, due to COVID-19?	3,85 (max)	0,95	4
Q11: How your interaction with your pairs has changed during the remote teaching experience with respect to the experience in presence ?	1,81 (min)	1,01	1

REMOTE TEACHING SECTION A,C - 14 ITEMS (3/3)

SECTION A:
effectiveness and organization of the course



SECTION C: the perceived difficulties
due to the transition in online learning modality



- as the AYA increased, the mean scores tended to increase
- exception of the fourth-year students
- regardless of gender

CONCLUSIONS AND DISCUSSION

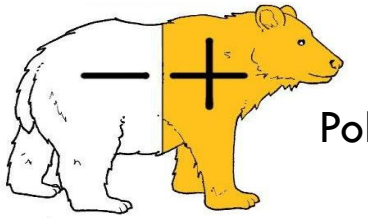
- Factors structure and the internal consistency were confirmed 👍
- Organization and effectiveness of online academic courses reached a positive consensus (efforts and support organized) 👍
- Overall evaluation of the learning experience was slightly negative. 👎
- Improved effective learning strategies during lockdown, with respect to the period before pandemic 👍
- Overcame the difficulties due to the emergency remote teaching by improving their cognitive processes 👍
- Remote Teaching section: Independence of learners' gender and indipendence of level of study degree

PERSPECTIVES

- Deepen dependence of Metacognitive skills on other factors
- Cross-correlation between Metacognitive skills and Subjective well being
- From factors to Cluster analysis
- Extend analysis to Subjective well-being, Identity, Socio-demo Info…

THANKS

THANKS FOR YOUR ATTENTION
ANY QUESTIONS?



Polar Bear

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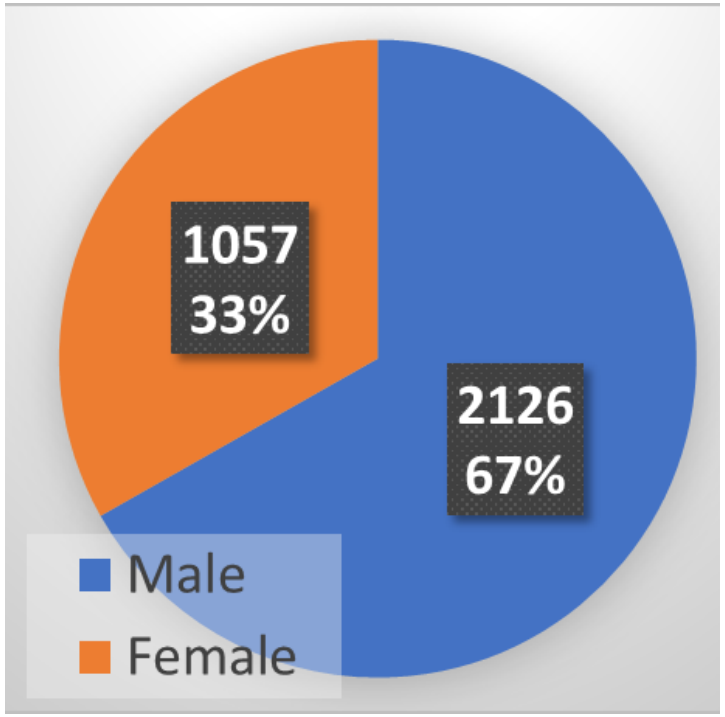
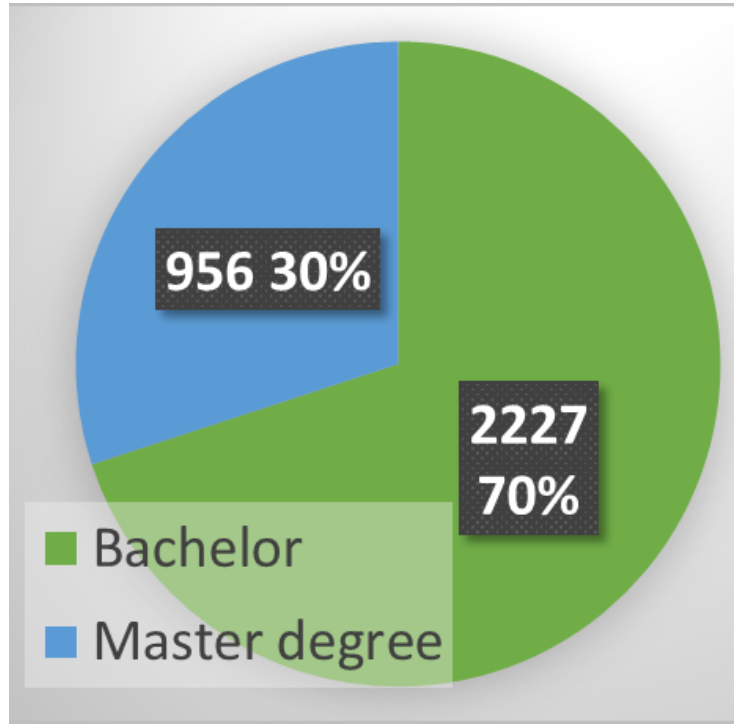
REMOTE TEACHING -

		A			B			C		
Group (Gender-AYA)	Students number	Median	Mean	Standard deviation	Median	Mean	Standard deviation	Median	Mean	Standard deviation
M-1st	410	3.50	3.53	0.82	2.50	2.50	0.66	2.67	2.64	0.63
F-1st	202	3.50	3.56	0.77	2.50	2.50	0.62	2.50	2.63	0.64
M-2nd	527	4.00	3.71	0.87	2.83	2.75	0.77	2.83	2.82	0.72
F-2nd	270	4.00	3.72	0.83	2.67	2.66	0.72	2.83	2.84	0.69
M-3rd	565	4.00	3.84	0.96	2.83	2.90	0.84	3.00	2.99	0.79
F-3rd	253	4.00	3.80	0.85	2.67	2.78	0.77	3.00	2.97	0.69
M-4th	317	4.00	3.74	0.94	2.67	2.78	0.86	2.83	2.84	0.81
F-4th	205	4.00	3.75	0.82	2.50	2.65	0.79	2.67	2.73	0.75
M-5th	307	4.00	3.96	0.92	2.83	2.88	0.82	3.00	3.01	0.75
F-5th	127	4.00	3.96	0.78	2.83	2.84	0.79	3.00	3.04	0.68





Main features of the sample

RT (Remote Teaching)

Screenshot of the original questions

Cosa pensi della didattica in remoto erogata dal tuo corso di studi causa pandemia da COVID-19? *

Contrassegna solo un ovale.

	1	2	3	4	5	
Per niente efficace	◯	◯	◯	◯	◯	Del tutto efficace

	1	2	3	4	5	
not at all effective						completely effective

Come è cambiata la tua interazione con i tuoi compagni durante l'esperienza della didattica in remoto rispetto a quella in presenza? *

Contrassegna solo un ovale.

	1	2	3	4	5	
Molto peggiorata	◯	◯	◯	◯	◯	Molto migliorata

	1	2	3	4	5	
definitely worse						definitely better

METACOGNITION

Screenshot of the original questions

Faccio dei riassunti delle cose più importanti *

Contrassegna solo un ovale per riga.

	Per niente in accordo	Poco d'accordo	Abbastanza d'accordo	Molto d'accordo	Del tutto d'accordo
Prima della pandemia	◯	◯	◯	◯	◯
Adesso	◯	◯	◯	◯	◯

	Strongly disagree	*Disagree*	*Somewhat agree*	*Agree*	Strongly agree
Before pandemic (PRE)					
(NOW)					

RT

VD02. What do you think of the remote teaching provided by your course of study due to the COVID-19 pandemic

VD03. What do you think of the organization of teaching (timetables, exams) adopted by your course of study due to the COVID-19 pandemic?

VD04. How has your general preparation changed during the remote teaching experience compared to the face-to-face one?

VD05. How has your perception of the effectiveness of teachers changed during the remote teaching experience compared to the face-to-face one?

VD06. How has the attitude of teachers changed towards your difficulties during the remote teaching experience compared to the face-to-face one?

VD07. How has the clarity of the teachers in the presentation of the topics changed during the remote teaching experience compared to the face-to-face one?

VD08. How has the ability of your teachers to stimulate interest in the subject changed during the teaching experience remotely compared to the face-to-face one?

VD09. How has your interaction with teachers changed during the remote teaching experience compared to face-to-face?

VD010.How has the study load required by your teachers changed during the remote teaching experience compared to the face-to-face one?

VD011.How has your interaction with your peers changed during the remote teaching experience compared to the face-to-face one?

VD012.How has your perception of the usefulness of studies changed during the remote teaching experience compared to the face-to-face one?

VD013.How has your perception of job prospects changed during the remote teaching experience compared to the face-to-face one?

VD014.How has your perception of the issues related to your course of study changed during the experience of remote teaching compared to the face-to-face one?

VD015.How has your perception of your difficulties in completing the course changed during the remote teaching experience compared to the face-to-face one?

List of the statements repeated twice: PRE and NOW

M21. I make summaries of the most important things

M22. I look for similarities or differences between what I am studying and what I already know

M23. I repeat the important things to know over and over

M24. I wonder if I agree with what I read in the books or with what is explained in classroom

M25. I check if I understand correctly what I am reading

M26. I write down the most important concepts of a particular topic I study

M27. I look for links between the different subjects I study

M28. I review a topic several times if I want to learn it well

M29. I try to get my own personal idea of the things I study

M30. I check which part of a topic I'm studying isn't still so clear for me

M31. I make diagrams or maps of the most important topics

M32. I try to see how what I am studying relates to what I already know

M33. I often repeat the most important concepts to myself in order to memorize them better

M34. I try to criticize or question what I find in the books

M35. I try to make sure I understand what I am studying

Tab. 10 Descriptive statistics scores for learners attending different academic years, grouped by gender

Group (Gender-AYA)	Students number	Median	Mean	Standard deviation
M-1st	410	2.67	2.64	0.63
F-1st	202	2.50	2.63	0.64
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F-4th	205	2.67	2.73	0.75
M-5th	307	3.00	3.01	0.75
F-5th	127	3.00	3.04	0.68

Metacognition (MC)

At first, we computed the descriptive statistics. Then, according to Kline [27], using a confirmatory factor analysis, we checked the model fit of the five factors described previously [18] by calculating the Root Mean Square Error of Approximation (RMSEA) [28] and the Tucker–Lewis Index (TLI) [29]. The values of TLI (0,911 and 0,909) were greater than 0,90 (acceptable fit) and the RMSEA coefficients (0,076 and 0,077) were smaller than 0,08 (reasonable approximate fit), so the fit was confirmed [30]. The complete data are available in Appendix B. Then, we tested the internal consistency of each of the five factors by computing Cronbach's alpha statistics. [31]

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