

INTERMEDIATE TESTS: A SUCCESSFUL TOOL TO STIMULATE HIGHER EDUCATION ACCOUNTING STUDENTS TO USE ONLINE FORMATIVE ASSESSMENTS?

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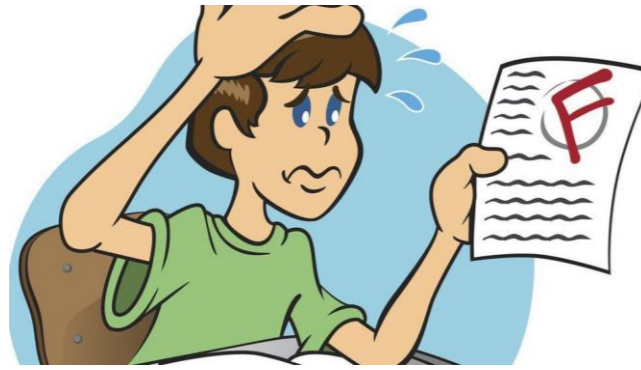
INTRODUCTION + LITERATURE

Introduction

Literature

Method

Results



“My course grades are not good”



First-year students benefit from regular formative assessments
→ Online Formative Assessment (OFA)



“I do not use additional learning material that often”

INTRODUCTION + LITERATURE

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“I do not use additional learning material
that often”

How can students be stimulated to engage more in OFA?



Providing an incentive can stimulate
student participation (Kibble, 2007)

Intermediate tests
+ credit

INTRODUCTION + LITERATURE

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Online Formative Assessment (OFA)

Intermediate tests

Supplementary learning tool

Computer-based tool

Constructed exercises, automatic grading, and immediate feedback

- Voluntary
- No influence on student course grades

- Mandatory
- Influence on student course grades

General RQ: can OFA participation be increased via two intermediate tests, using the same online environment as OFAs?

We expect that when intermediate tests are introduced, whether

- (1) **More students** use OFA;
- (2) **Students use of OFA more intensively**

- *Procrastination* is harmful to succeed in the accounting exam (Sithole and Abeysekera, 2017 and Corral et al., 2020).
- Intermediate tests can serve as a good tool for students to better distribute study time (Day et al., 2018).

General RQ: can OFA participation be increased via two intermediate tests, using the same online environment as OFAs?

When intermediate tests are introduced, whether

- (1) More students use OFA;
- (2) Students use of OFA more intensively;
- (3) Students **start earlier** with the use of OFA

LITERATURE

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- Positive relation between OFA and performance (e.g. Einig, 2013)
- Positive relation between intermediate tests and performance (Kibble, 2007)
- Call for more investigation on the *effectiveness* of student-centred methods (Pereira et al., 2016)

General RQ: can OFA participation be increased via two intermediate tests, using the same online environment as OFAs?

When intermediate tests are introduced, whether

- (1) More students use OFA;
- (2) Students use OFA more intensively;
- (3) Students start earlier with the use of OFA;
- (4) There is a beneficial effect on **performance**.

RESEARCH QUESTIONS

Introduction

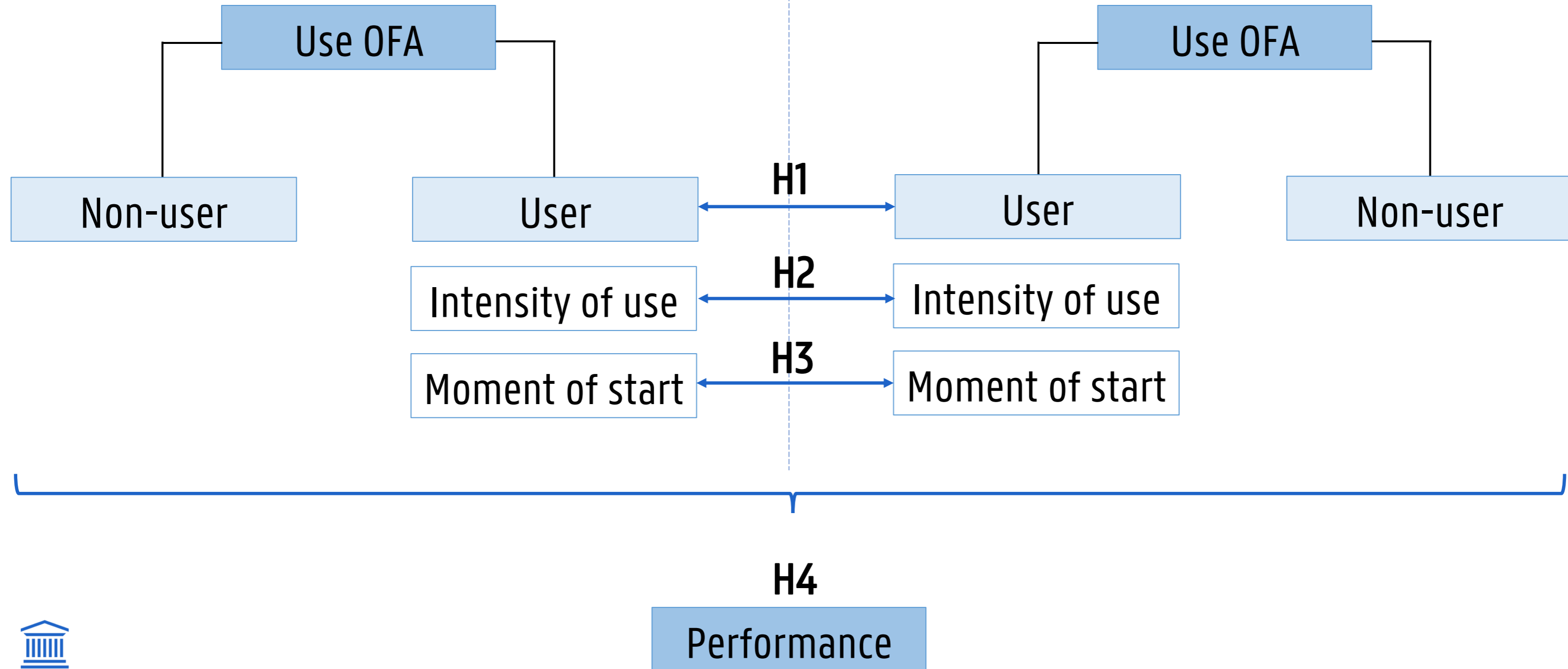
Method

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Conclusion

Control group (no intermediate tests)

Experimental group (intermediate tests)



RESEARCH QUESTIONS

Introduction

Method

Results

Conclusion

H4

Performance

Differences in performance

Intensity of use

Non-user

Light user

Medium user

Heavy user

Moment of start

Early starter

Mid starter

Late starter

Non-starter

Quasi-experiment

- Two-by-two factorial design
 - First factor = intermediate tests
 - Second factor = OFA

- Introductory financial Accounting course

RESEARCH DESIGN

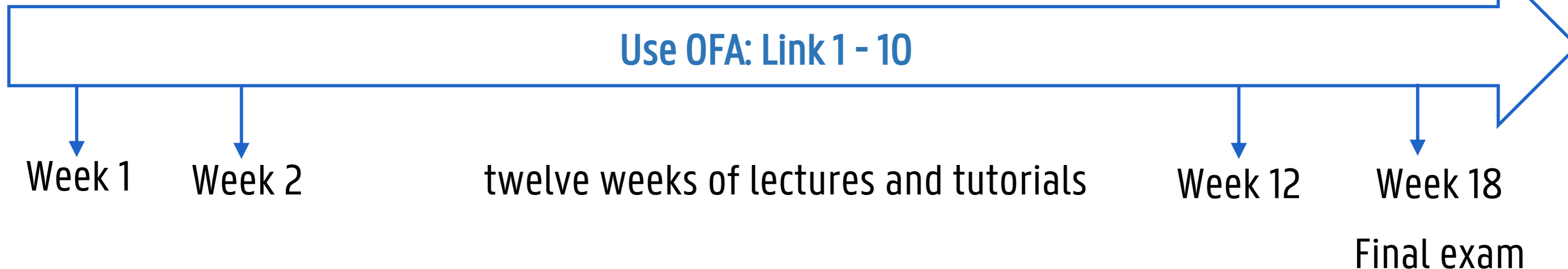
Introduction

Method

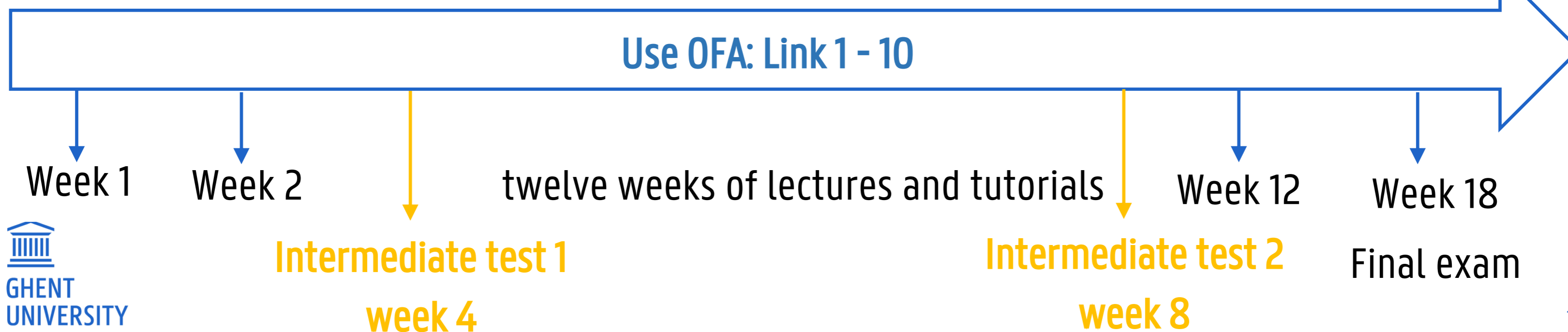
Results

Conclusion

Control group (no intermediate tests), $N = 595$



Experimental group (intermediate tests), $N = 575$ and $N = 603$



VARIABLES

Introduction

Method

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Conclusion

Variable

Operationalization

OFA variables

- OFA_{dummy} Dummy variable, 0 for non-user and 1 for user
- $OFA_{intensity}$ How many times a student completed a link in the OFA
- OFA_{start} The week a student started using OFA for the first time
- Extent $OFA_{intensity}$ divided in three groups and non-users: 1 for non-user, 2 for light user, 3 for medium user and 4 for heavy user
- Procrastination OFA_{start} divided in three groups and non-users: 1 for early starter, 2 for mid-semester starter, 3 for late starter and 4 for non-starter

Intermediate testing variable

- Intermediate tests Dummy variable, 0 for control group and 1 for experimental group

Performance variable

- Performance Grade obtained on the final summative exam, score on 60

Control variables

- Ability GPA1W, score on 400
- Gender Dummy variable, 0 for men and 1 for women

RESULTS – DESCRIPTIVES

Introduction	Method		Results	Conclusion
	Control group		Experimental group	
	Frequency	Percentage	Frequency	Percentage
Non-user	467	79%	699	61%
User	128	21%	452	39%
Extent				
Non user	467	79%	699	61%
Light user	74	12%	185	16%
Medium user	32	5%	74	6%
Heavy user	22	4%	193	17%
Procrastination				
Early starter	102	17%	260	22%
Mid starter	9	1%	68	6%
Late starter	17	3%	124	11%
Non starter	467	79%	699	61%
	595	100%	1151	100%
Male	357	60%	687	60%
Female	238	40%	464	40%

RESULTS – HYPOTHESIS 1

Introduction

Method

Results

Conclusion

		Control group	Experimental group	Total
Non-user	<i>N</i>	467	699	1,166
	% of total	79%	61%	67%
User	<i>N</i>	128	452	580
	% of total	21%	39%	33%
Total	<i>N</i>	595	1 151	
	% of total	34%	66%	

H1 supported

Pearson Chi-Square = 55.754 ; $p = .000$

RESULTS – HYPOTHESIS 2

Introduction

Method

Results

Conclusion

	Control group		Experimental group		<i>t</i> -value	<i>p</i> -value
	N	Mean	N	Mean		
OFA _{intensity}	128	2.67	452	4.58	-7.53	.000

H2 supported

RESULTS – HYPOTHESIS 3

Introduction

Method

Results

Conclusion

	Control group		Experimental group		<i>t</i> -value	<i>p</i> -value
	N	Mean	N	Mean		
OFA _{start}	128	4.35	452	7.87	-7.66	.000

H3 not supported

RESULTS – HYPOTHESIS 1 + 2

Introduction

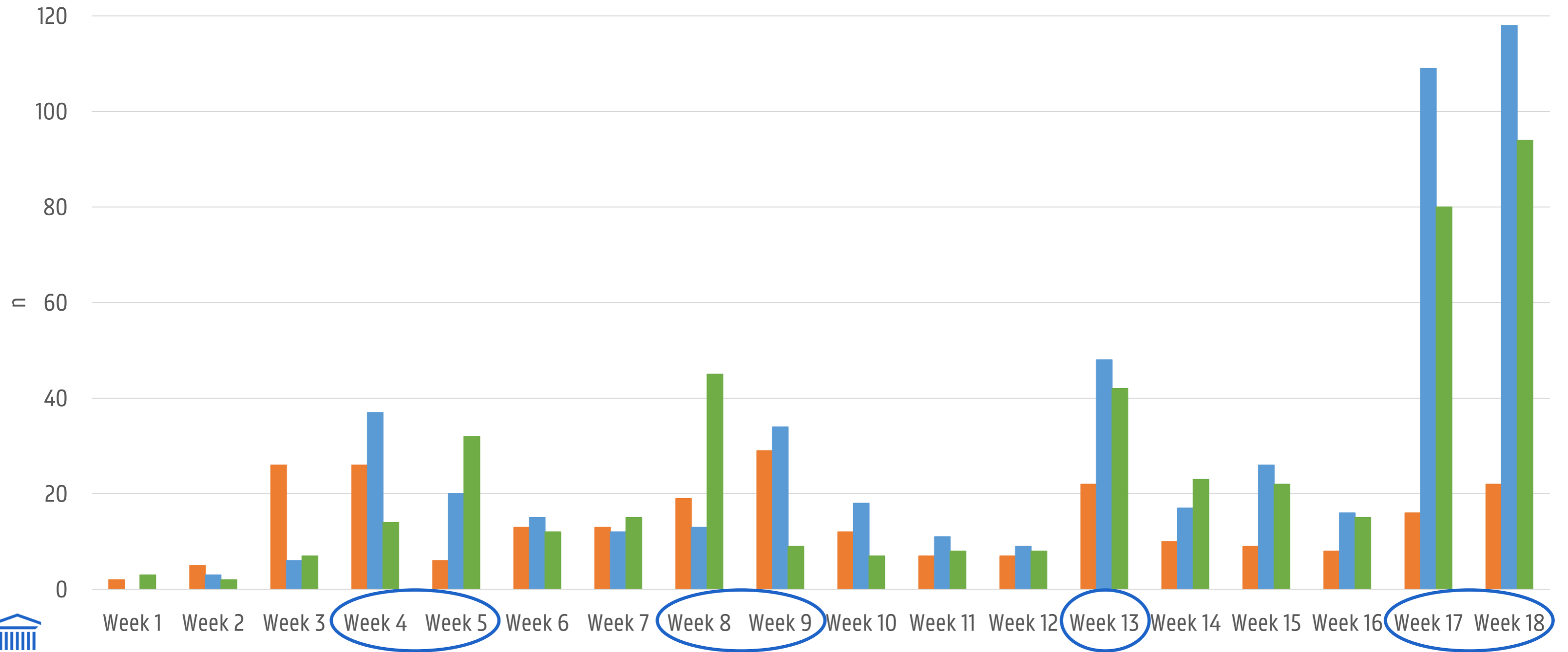
Method

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Conclusion

Number of users

■ N - Year 1 ■ N - Year 2 ■ N - Year 3



RESULTS – HYPOTHESIS 1 + 2

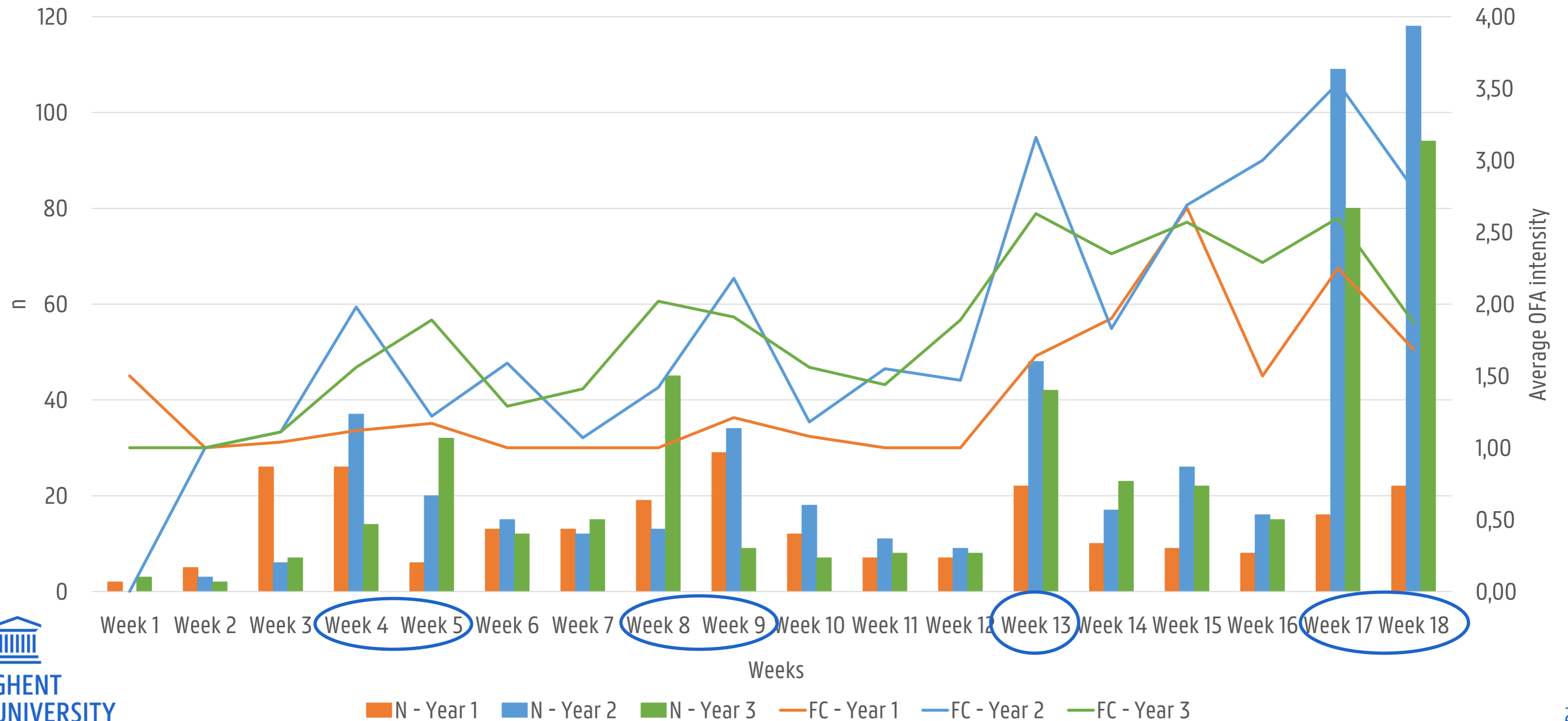
Introduction

Method

Results

Conclusion

Number of users + intensity of use



RESULTS – HYPOTHESIS 4

Introduction

Method

Results

Conclusion

ANCOVA DV = performance	Control and experimental group, N = 1,509			
	F-test	p-value		
Intercept	127.875	.000		
Ability	2670.184	.000		
Gender	11.095	.001		
Intermediate test (0 = no; 1 = yes)	213.022	.000		
Extent	10.805	.000 H4 supported		
F-value		504.023		
p-value		.000		
Adj. R ²		.667		
	Non-user	Light user	Medium user	Heavy user
Mean	32.016	33.467	33.970	35.025
N	961	242	100	206

RESULTS – HYPOTHESIS 4

Introduction	Method	Results	Conclusion		
	ANCOVA DV = performance	Control and experimental group, N = 1,509			
		F-test	p-value		
	Intercept	116.116	.000		
	Ability	1632.169	.000		
	Gender	10.249	.001		
	Intermediate test (0 = no; 1 = yes)	198.382	.000		
	Procrastination	10.533	.000 H4 supported		
	F-value	503.623			
	p-value	.000			
	Adj. R ²	.667			
		Early starter	Mid starter	Late starter	Non-starter
	Mean	34.582	34.021	33.041	32.024
	N	345	67	136	961

LIMITATIONS AND FUTURE RESEARCH

- Self-selection bias
- Only at one university, though over three years
- No international students included in the sample
- The effect of one credit is tested
- Paper-based on-campus intermediate tests vs. online test

TAKE-AWAYS

When intermediate tests are introduced,

- There are **more OFA user students**
- Students use OFA more **intensively**
- Students exhibit more **procrastination**, or is it **replacement**?
- **OFA works!**

Non-user

Light user

Medium user

Heavy user

Early starter

Mid starter

Late starter

Non-starter

THANK YOU FOR YOUR ATTENTION!

QUESTIONS? SUGGESTIONS?

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