JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

From Opinions to Evidence: Critical Thinking Skills at the Start of Higher Education

Jani Ursin

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UNIVERSITY OF
EASTERN FINLAND

Content of the presentation

- Background of KAPPAS2 project
- Data and methods
- Preliminary findings
- Closing reflections and questions

The importance of generic skills in higher education

- **Policy emphasis**: Initiatives like the European Commission (2019) highlight the need for broad graduate skills—problem-solving, critical thinking, collaboration, and communication—alongside professional expertise.
- **Future-ready skills**: Generic skills are vital for lifelong learning and thriving in an AI-driven world (Rahyuni et al., 2025).
- **HE focus**: HEIs aim to foster higher-order cognitive skills such as reasoning, argumentation, and decision-making (Lemons & Lemons, 2017).
- **Challenges**: Research shows these skills are not consistently developed, especially in early study phases (e.g., Arum & Roksa, 2011; Evens et al., 2013; Hyytinen et al., 2015; Ursin et al., 2021; Kleemola et al., 2023).
- To gain deeper insight into the mastery of generic skills among Finnish HE students, the Ministry of Education and Culture has funded two projects: KAPPAS1 (2018–2021) and KAPPAS2 (2023–2025).

Korkeakouluopiskelijoiden oppimistulosten arviointi Suomessa (KAPPAS) projects aim to

1. Identify the **level** of generic skills among Finnish HE students.
2. Investigate the **factors** associated with the level of generic skills.
3. Examine the extent to which these skills **develop** during HE studies.

Project management and coordination

Steering Committee	The national project coordination. Representatives from all participating HEIs and the Finnish Ministry of Education and Culture (Chair: Counsellor for Education **Maarit Palonen**).
JYU: Finnish Institute for Educational Research (FIER)	Responsible for the management of the project, translation of the tests and test environment, selection of students, scoring, data analysis and reporting. Project Manager **Jani Ursin**, Lead Scorer and Data Manager **Kari Nissinen** and Project Researcher **Kaisa Silvennoinen** and Research Assistant **Martta Jämsä** (50%).
UEF: School of Educational Sciences and Psychology, Philosophical Faculty	UEF is involved in the translation and adaptation of the tests, cognitive labs, scoring, data analysis and reporting. Deputy Project Manager **Heidi Hyytinen,** Doctoral Researcher **Lotta Väänänen** and Research Trainee **Martta Jämsä** (50%).
Council for Aid to Education (CAE)	The international coordinator and developer of the CLA+ International test. Contact person: Chief Academic Officer **Doris Zahner.**
Institutional Coordinators	Responsible for organizing test sessions at HEIs.

Participating HEIs

UASs (# of students)

1. Arcada UAS (2730)
2. Haaga-Helia UAS (10 023)
3. Häme UAS (8955)
4. Jamk UAS (8652)
5. Kajaani UAS (3402)
6. Lapland UAS (6012)
7. Metropolia UAS (17 106)
8. Novia UAS (4746)
9. Police University College (N/A)
10. Savonia UAS (8073)
11. Tampere UAS (10 941)
12. Turku UAS (12 051)
13. Vaasa UAS (3516)

Universities (# of students)

1. University of Helsinki (26 130)
2. University of Eastern Finland (14 376)
3. University of Lapland (4275)
4. Lappeenranta-Lahti University of Technology LUT (6630)
5. University of Vaasa (5091)

Finland has 38 HEIs (24 UASs and 14 universities).

Generic skills investigated in the KAPPAS2 project

- Measured generic skills are:
  1. **Analytical reasoning and evaluation** (the ability to identify the strengths and weaknesses of different arguments and to distinguish reliable sources from unreliable ones).
  2. **Analysis and problem solving** (recognizing a problem situation and providing a well-reasoned solution).
  3. **Writing effectiveness** (producing a persuasive text and maintaining coherence in argumentation).
  4. **Writing mechanics** (mastery of established conventions in written language).
- These skills reflect students' proficiency in **critical thinking** and **argumentation**.
- The adopted performance-based Collegiate Learning Assessment (**CLA+**) International test consists of two main sections: an essay-based performance task and selected-response questions.
- Through real-world scenarios, the CLA+ requires students to analyze information, weigh evidence, and craft reasoned arguments.
- The student completes a 90-minute supervised computer-based test and then fills out a background questionnaire.

Main findings from the KAPPAS1 project (2018–2021)
(Ursin, Hyytinen & Silvennoinen, 2021)

- **59 percent** of higher education students had, at best, **a basic level of generic skills**, while only a few demonstrated an advanced level (cf. van Damme & Zahner, 2022)*.
  - University students outperformed those in UASs.
  - 62% of first-year UAS students had, at most, basic-level skills.
  - In contrast, 28% of final-year university students reached at least accomplished mastery level.
- Predictors of skill mastery:
  - Strong performance in the matriculation exam (mother tongue).
  - Socioeconomic background—especially number of books at home.
  - Student effort during the test.

*Mastery levels: Below basic (heikko), basic (tyydyttävä), proficient (hyvä), accomplished (kiitettävä), advanced (erinomainen).

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- KAPPAS2: Building on KAPPAS1
  - Expands the original study with a **longitudinal** focus on the development of generic skills during HE studies
  - Includes **both bachelor's and master's** students
  - Collects **register data** on academic achievement and study progress
  - Adds questions on student **well-being** and **sense of belonging** in the background survey
- Focus of this presentation
  - Highlights preliminary KAPPAS2 findings on first-year students' generic skill levels.
  - Examines factors influencing the mastery of critical thinking and argumentation skills.
  - Compares results with KAPPAS1 to identify trends in mastery among first-year HE students.

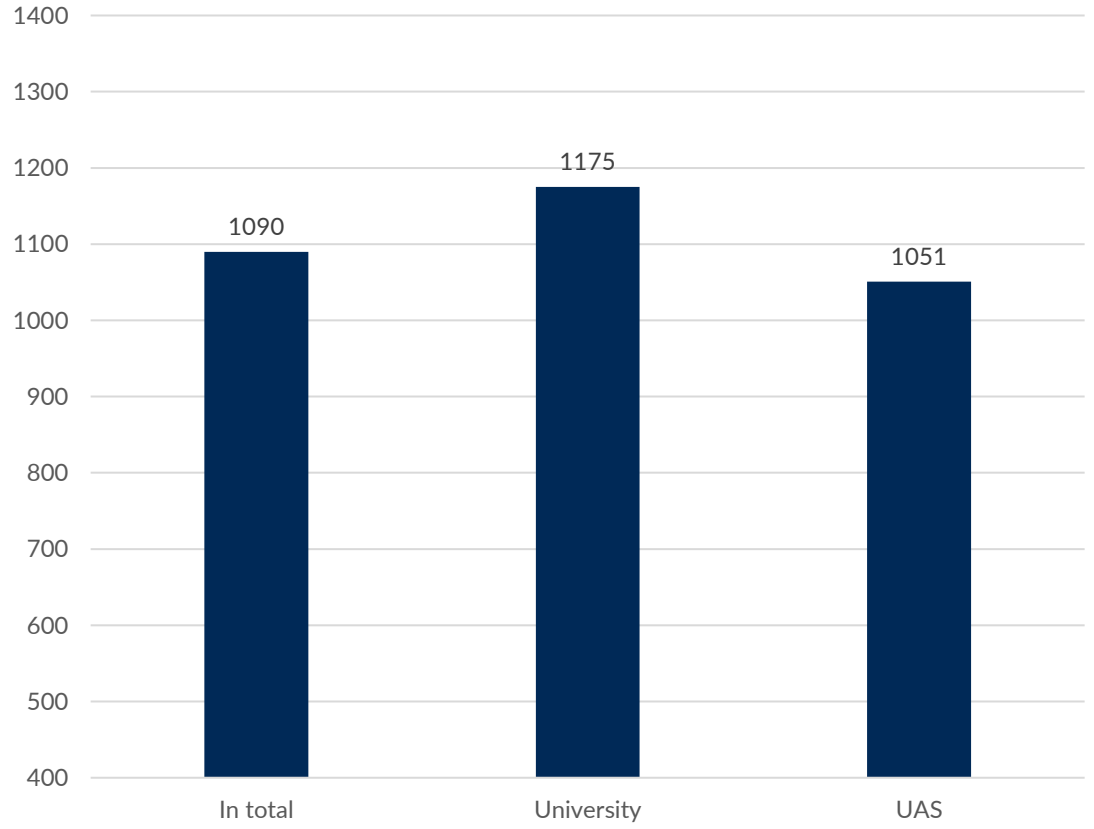
Data and methods

- Data
  - Overall, **2,360** first-year students participated in the study, of whom:
    - **333** (14 %) were from universities and **2,025** (86%) from UASs.
    - **1,209** were male (52%) and **1,018** were female (44%).
    - **1,677** (73%) had passed the matriculation examination (i.e., were high school graduates), while **637** (27%) had not—most of whom were from UASs.
  - Participation rate **29%**.
- Methods
  - The data were analyzed using descriptive statistics and regression models.
  - Survey weights were computed to adjust for sample bias.
  - To enable comparison between the KAPPAS1 and KAPPAS2 datasets, the equipercentile equating method was applied.

Preliminary findings

CLA+ mean scores by type of HEI and in total

- First-year university participants scored significantly higher than their UAS counterparts.
- The difference was 124 points in favor of the university participants.
- University students seem to enter HE with stronger critical thinking and argumentation skills than their UAS counterparts.



Participants' mastery levels by type of HEI and overall (%)

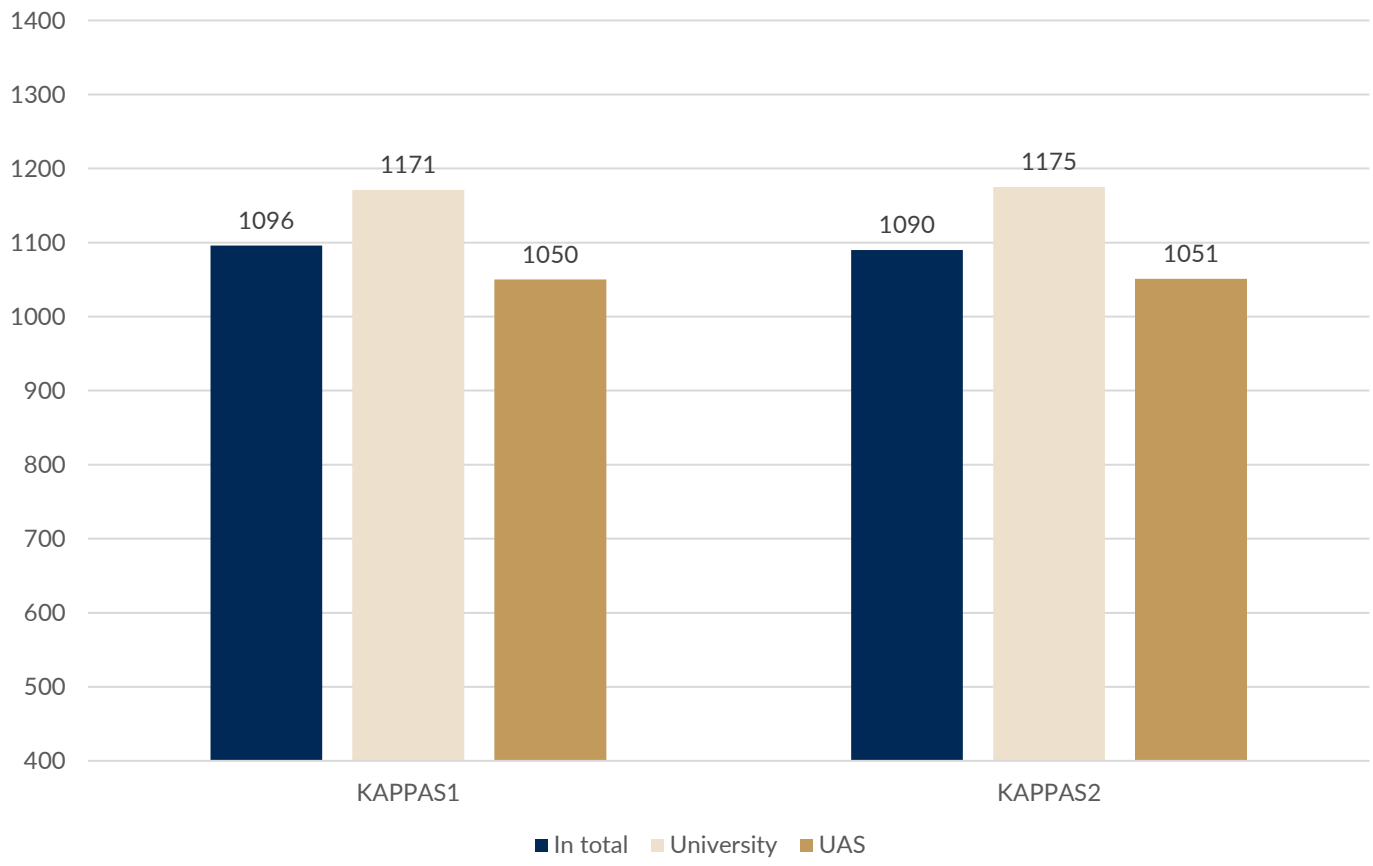
	Advanced	Accomplished	Proficient	Basic	Below basic
In total	2	15	32	31	19
University students	6	28	40	21	5
UAS students	1	9	29	35	25

- For **half of the participants, generic skills were assessed at a basic or lower level**, while the remaining participants demonstrated proficiency or higher-level performance.
- **19% of all participants—and 25% of UAS participants** classified as 'below basic'—did not meet the minimum response requirements, indicating **a lack of fundamental critical thinking and argumentation skills**.
- Only a small number of participants achieved the highest mastery level (advanced).
- **34% of university participants reached the top two mastery levels, compared to just 10% of UAS participants**. These participants demonstrated strong analytical skills, identified biases, used evidence effectively, and presented clear, well-structured arguments.

CLA+ mean scores by KAPPAS1 and KAPPAS2

In KAPPAS1, first-year students were tested in Fall 2019–2020, and in KAPPAS2, in Fall 2023.

Trends in generic skill remained consistent across both projects.

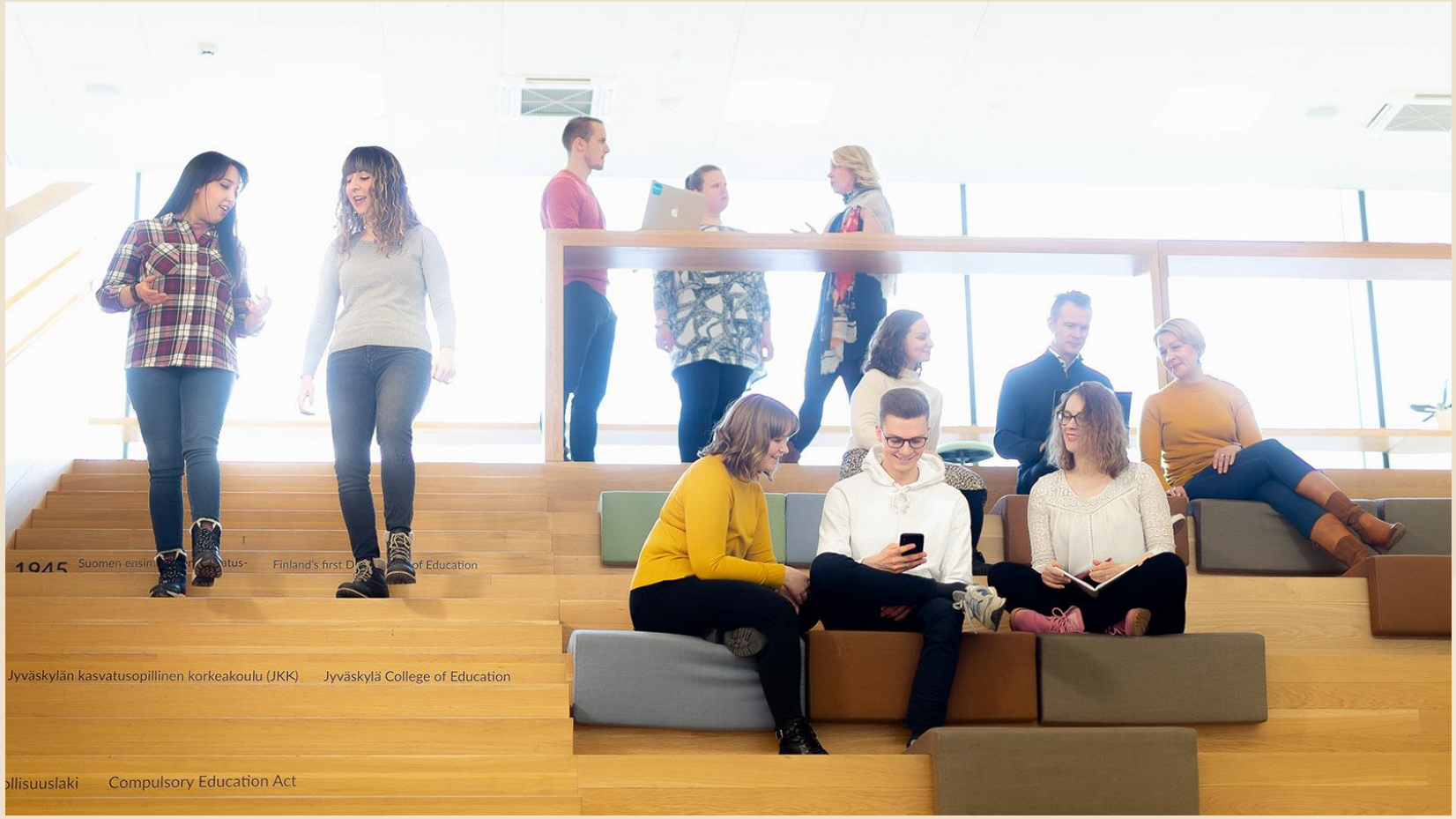


Participants' mastery levels in KAPPAS1 and KAPPAS2 by type of HEI and overall (%)

	Advanced		Accomplished		Proficient		Basic		Below basic	
	KAPPAS1	KAPPAS2	KAPPAS1	KAPPAS2	KAPPAS1	KAPPAS2	KAPPAS1	KAPPAS2	KAPPAS1	KAPPAS2
In total	3	2	17	15	29	32	31	31	19	19
Uni students	7	6	30	28	35	40	21	21	7	5
UAS students	1	1	10	9	26	29	38	35	25	25

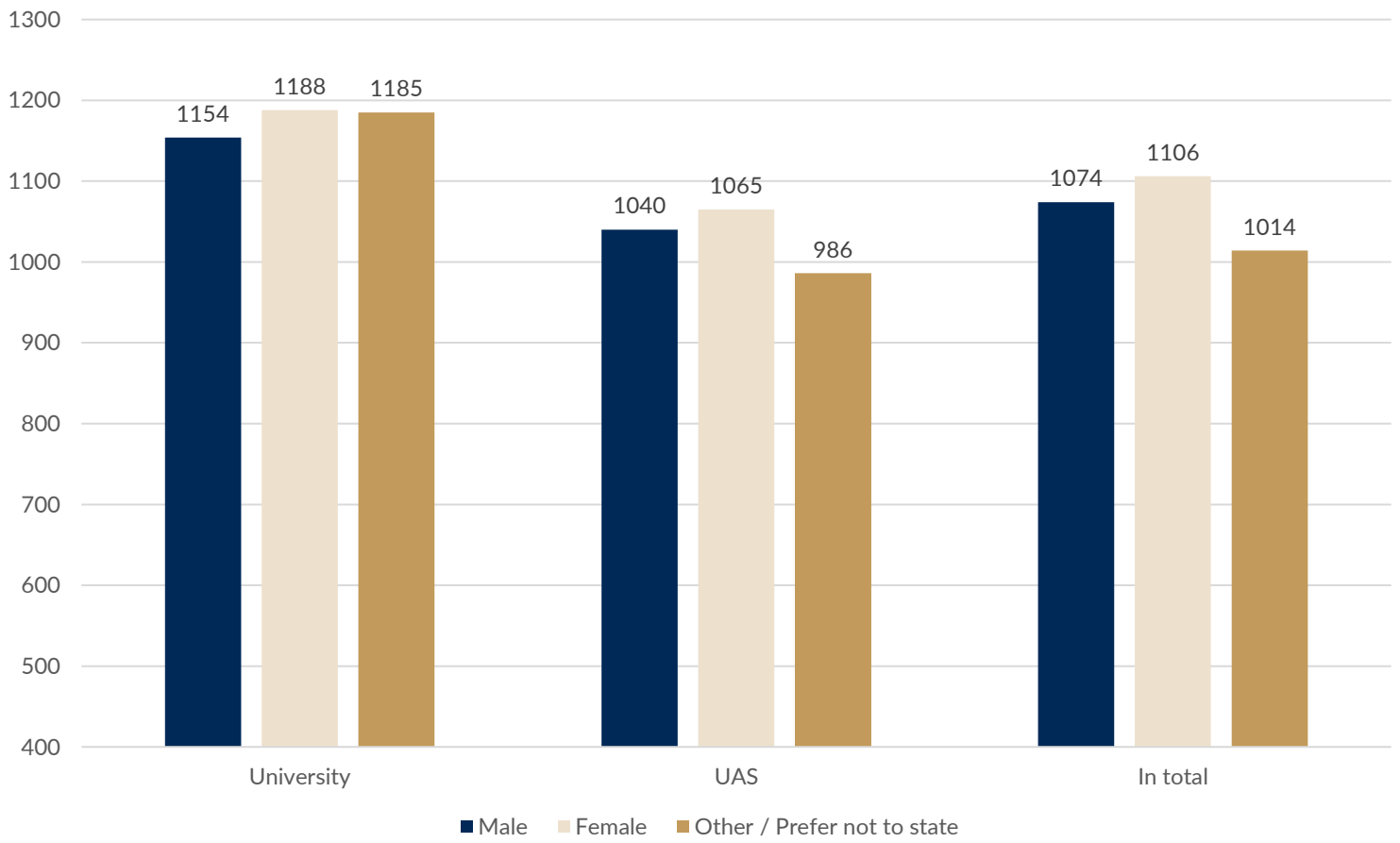
- **The same trend is evident when mastery levels are considered.**

Preliminary Findings on Background Variables and Generic Skills



Gender and CLA+ mean scores

- Female students slightly outperform males in critical thinking and argumentation: +34 pts in universities, +25 pts in UAS, +32 pts overall.



Participants' mastery levels by gender (%)

	High mastery			Low mastery		
	University	UAS	Total	University	UAS	Total
Male	24	10	14	6	29	22
Female	41	10	21	5	21	16
Other / Prefer not to state	50*	10	16	25*	43	40

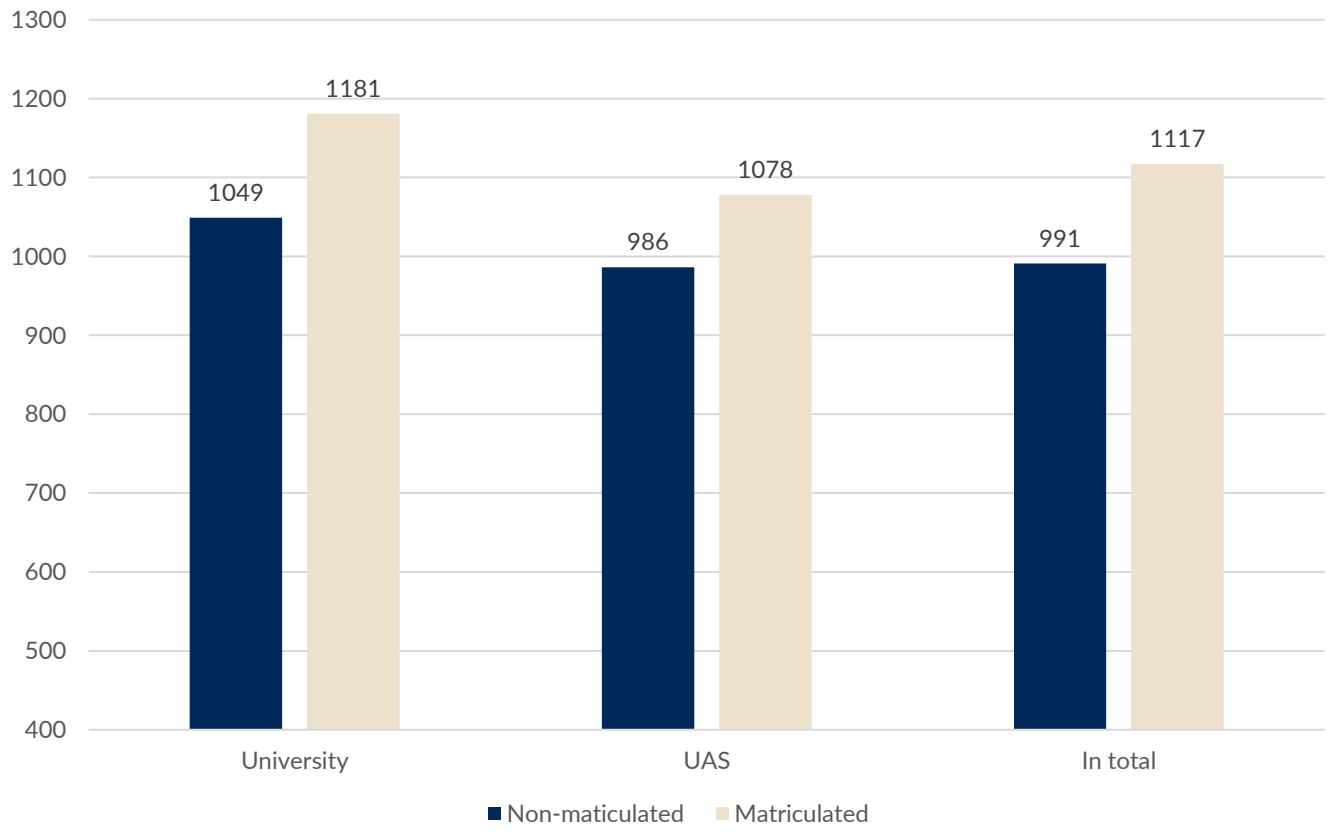
*n<10

- More than 40% of female university students achieved high mastery, while nearly 30% of male and just over 20% of female UAS students lacked proficiency in critical thinking and argumentation skills.

Note: "High mastery" refers to performance at or above the accomplished level; "Low mastery" indicates performance at below basic level.

Matriculation examination and CLA+ mean scores

- Matriculated participants scored significantly higher: +132 pts in universities, +92 pts in UAS, and +126 pts overall.
- Differences between university and UAS participants partly reflect the share of matriculated students in each group.



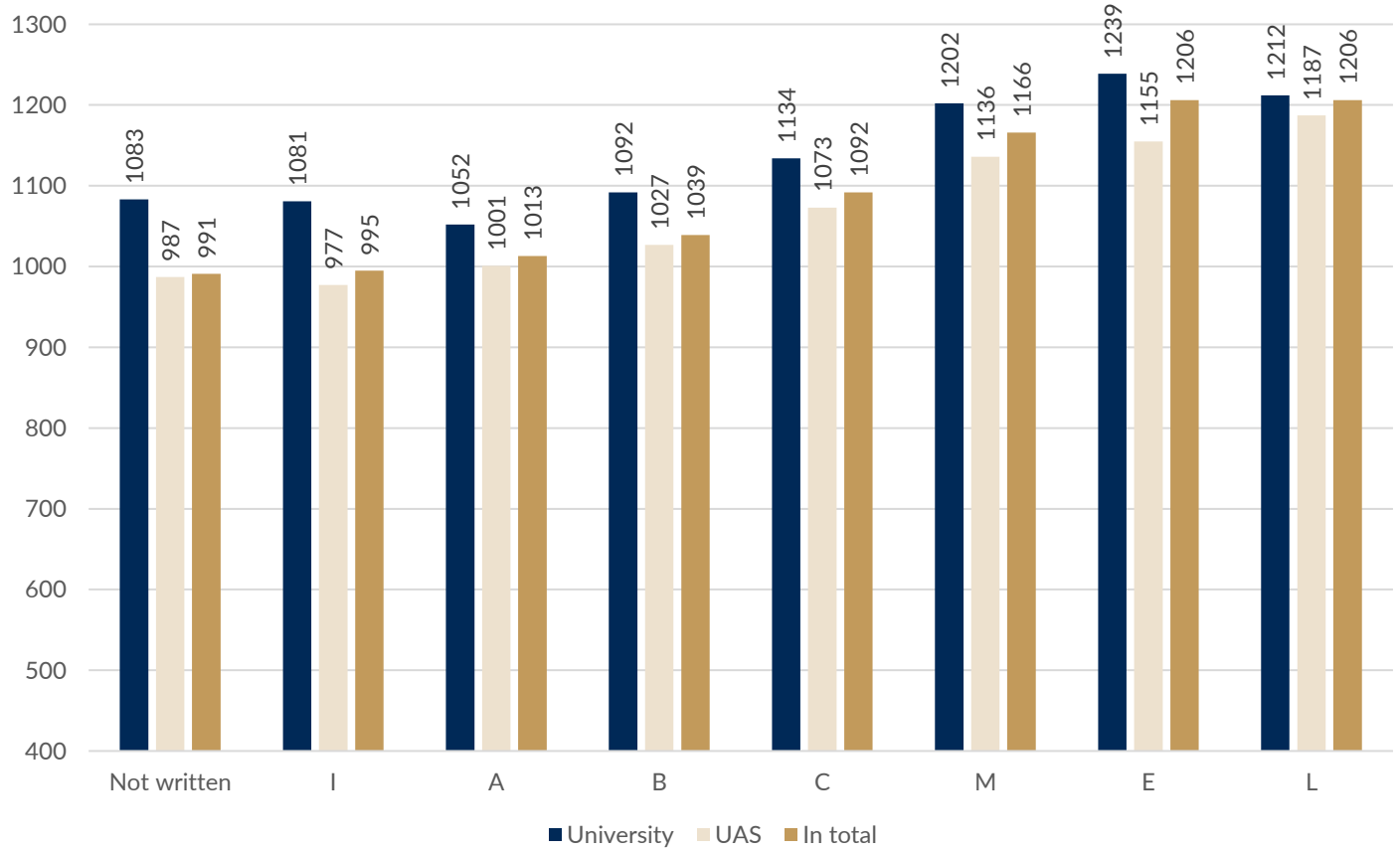
Participants' mastery levels by matriculation examination (%)

	High mastery			Low mastery		
	University	UAS	Total	University	UAS	Total
Non-matriculated	1	3	3	25	42	41
Matriculated	36	13	22	4	18	13

- High mastery levels reached by matriculated students:
  - 36% of university participants
  - 13% of UAS participants
- Low mastery level among non-matriculated students:
  - 25% of university participants
  - >40% of UAS participants
- Notably, 18% of matriculated UAS students still fell into the low mastery level.

Native language grade in matriculation examination and CLA+ mean scores

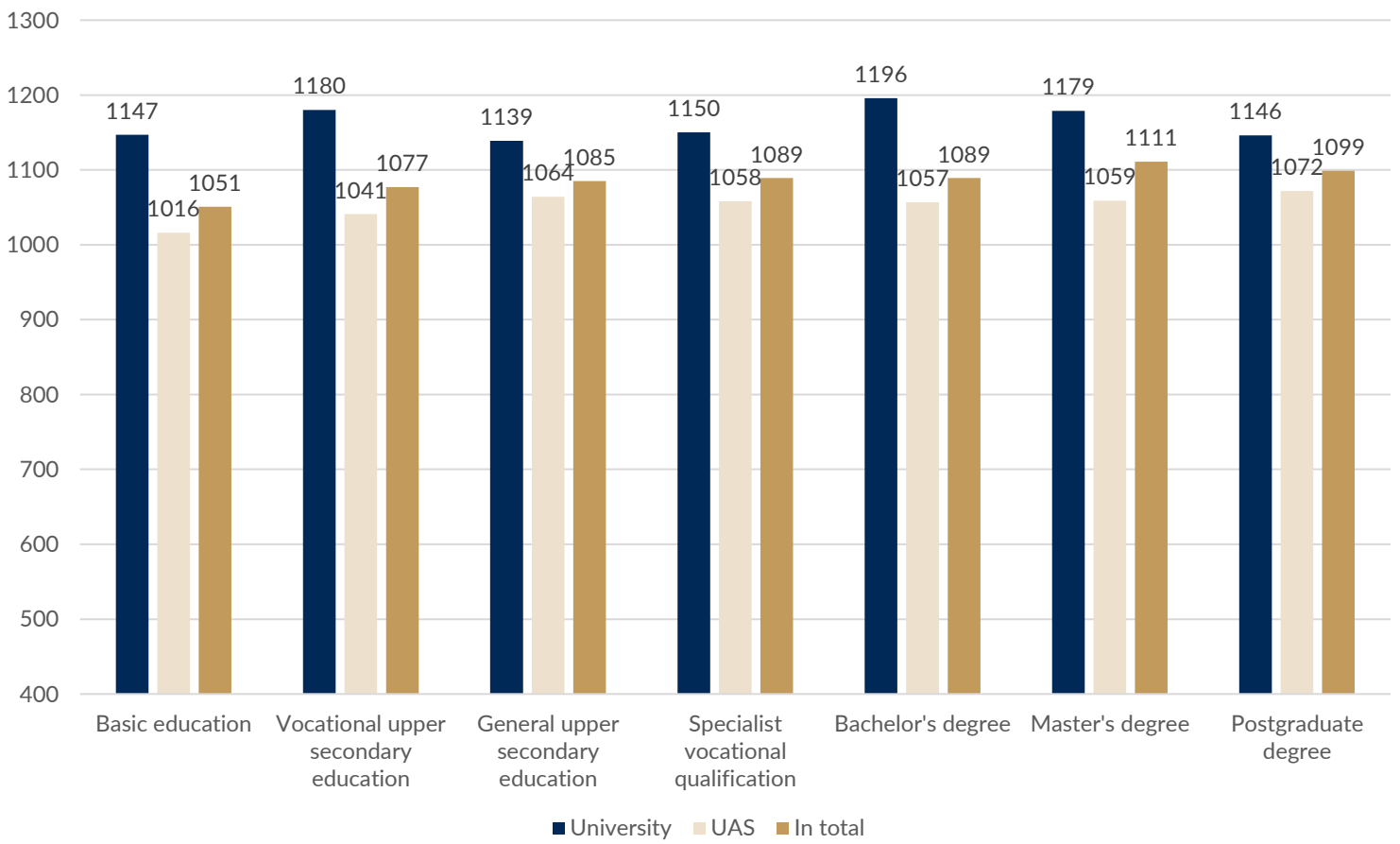
- CLA+ mean scores increase almost linearly with native language grades.
- University participants with the highest native language grade (L) score 131 points higher than those with the lowest grade (I).
- Among UAS participants, this difference is even larger: 210 points.



The **grades** in matriculation examination are (from highest to lowest): *laudatur (L)*, *eximia cum laude approbatur (E)*, *magna cum laude approbatur (M)*, *cum laude approbatur (C)*, *lubenter approbatur (B)*, *approbatur* (A) and *improbatur* (I, failed test).

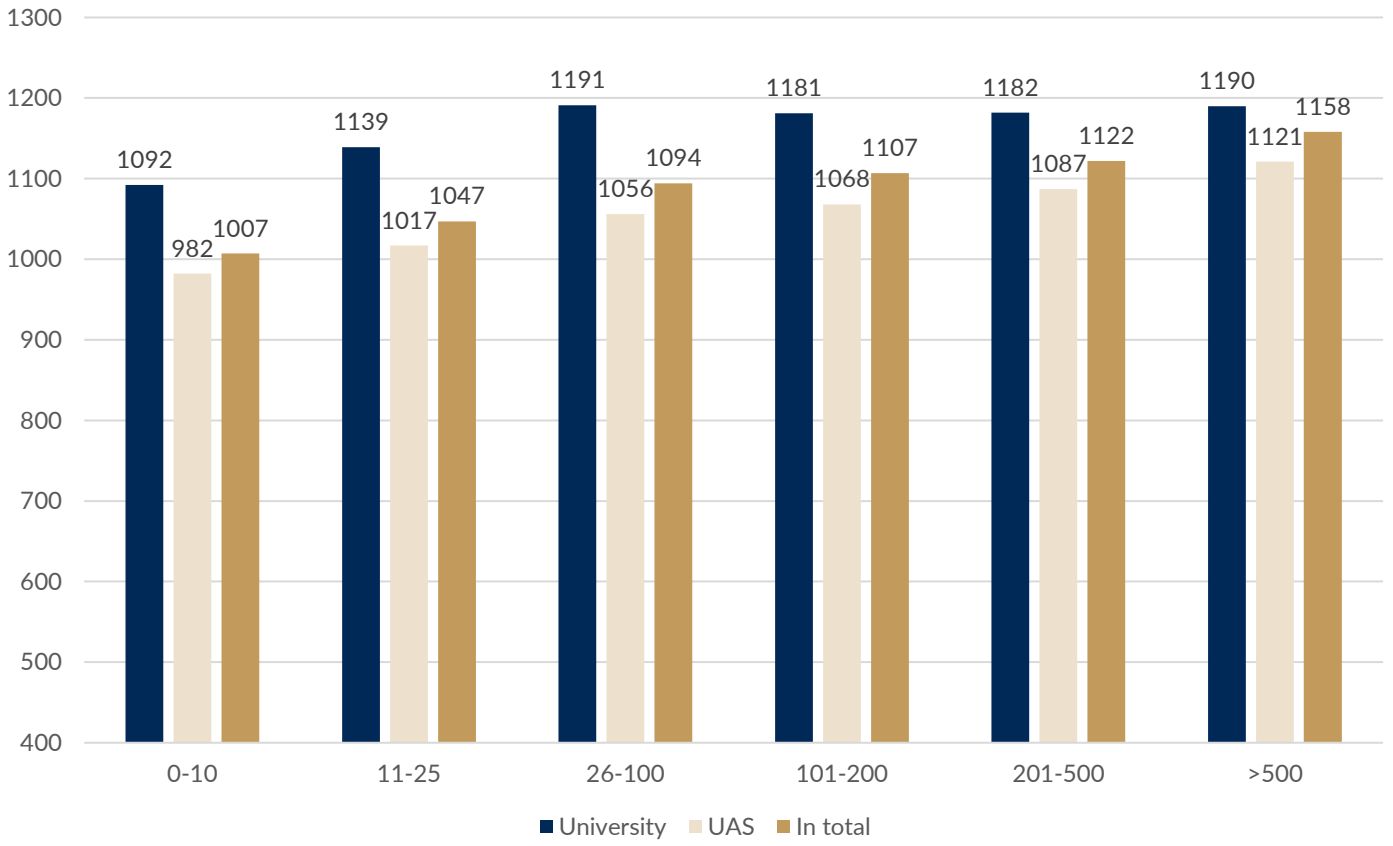
Parental education and CLA+ mean scores

- Differences in total scores based on parental education were modest.
- Participants whose parents had completed basic education only scored lower than most of the other groups.



Number of books at childhood home and CLA+ mean scores

- CLA+ mean scores increase linearly with number of books at childhood home.
- The difference between the two extremes—those who had the most books at home during childhood and those who had the fewest—was 98 points among university participants, 139 points among UAS participants, and 157 points overall.



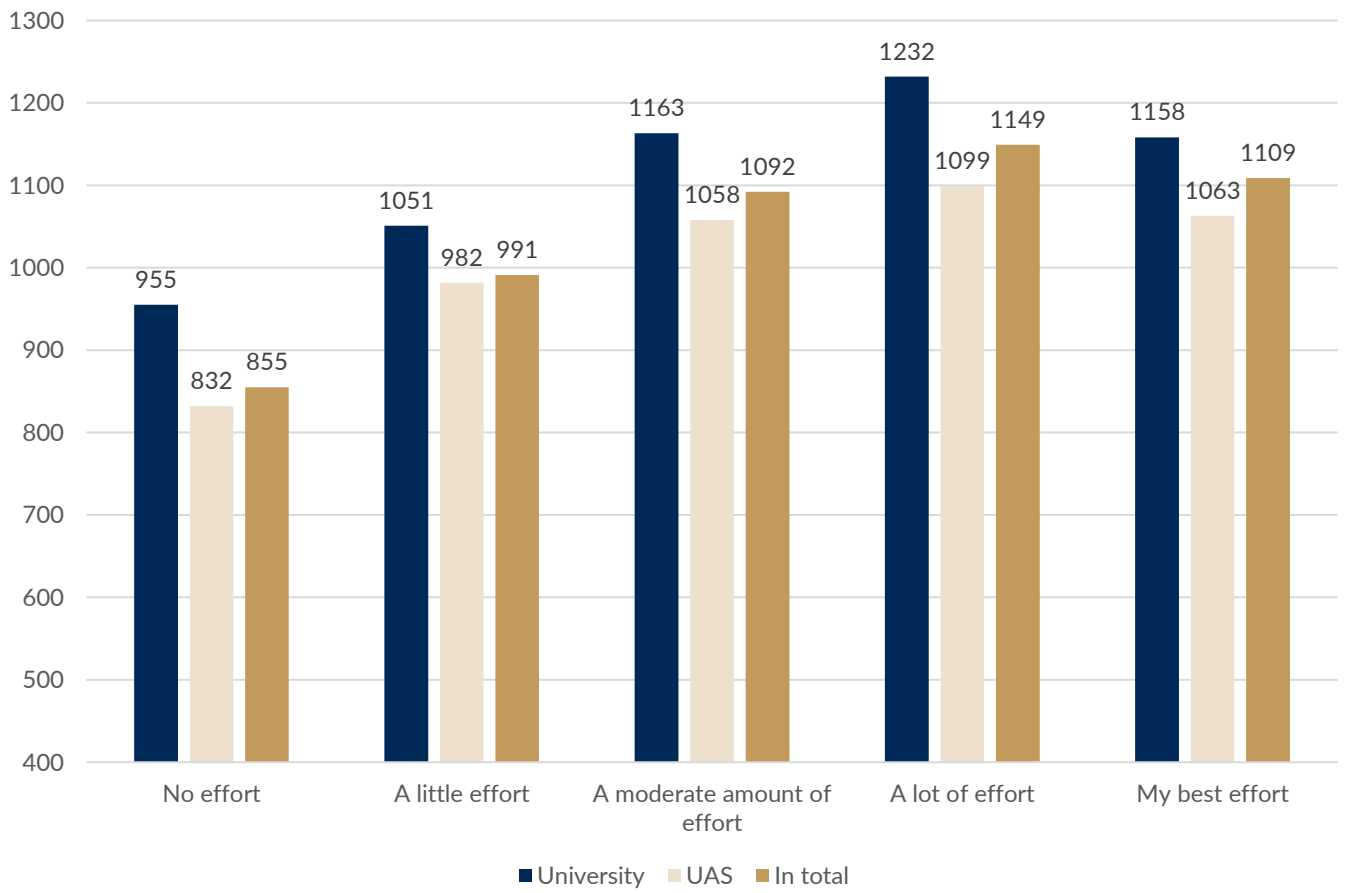
Participants' mastery levels by number of book at childhood home (%)

	High mastery			Low mastery		
	University	UAS	Total	University	UAS	Total
0-10	1	3	2	14	42	35
11-25	19	5	9	8	30	25
26-100	42	12	21	6	25	20
101-200	42	12	23	5	23	16
201-500	31	11	19	4	15	11
>500	34	20	28	0	8	4

- A home culture that supports reading and learning fosters the development of generic skills across both HE sectors.
- Conversely, participants from less supportive home environments—particularly those in UASs—appear to struggle with the development of critical thinking and argumentation skills.

Effort and CLA+ mean scores

- Participants who put no effort into the test scored significantly lower than all other groups
- Even a little effort made a difference: +96 pts among university students, +150 pts among UAS students, and +254 pts overall.



Participants' mastery levels by test-taking effort (%)

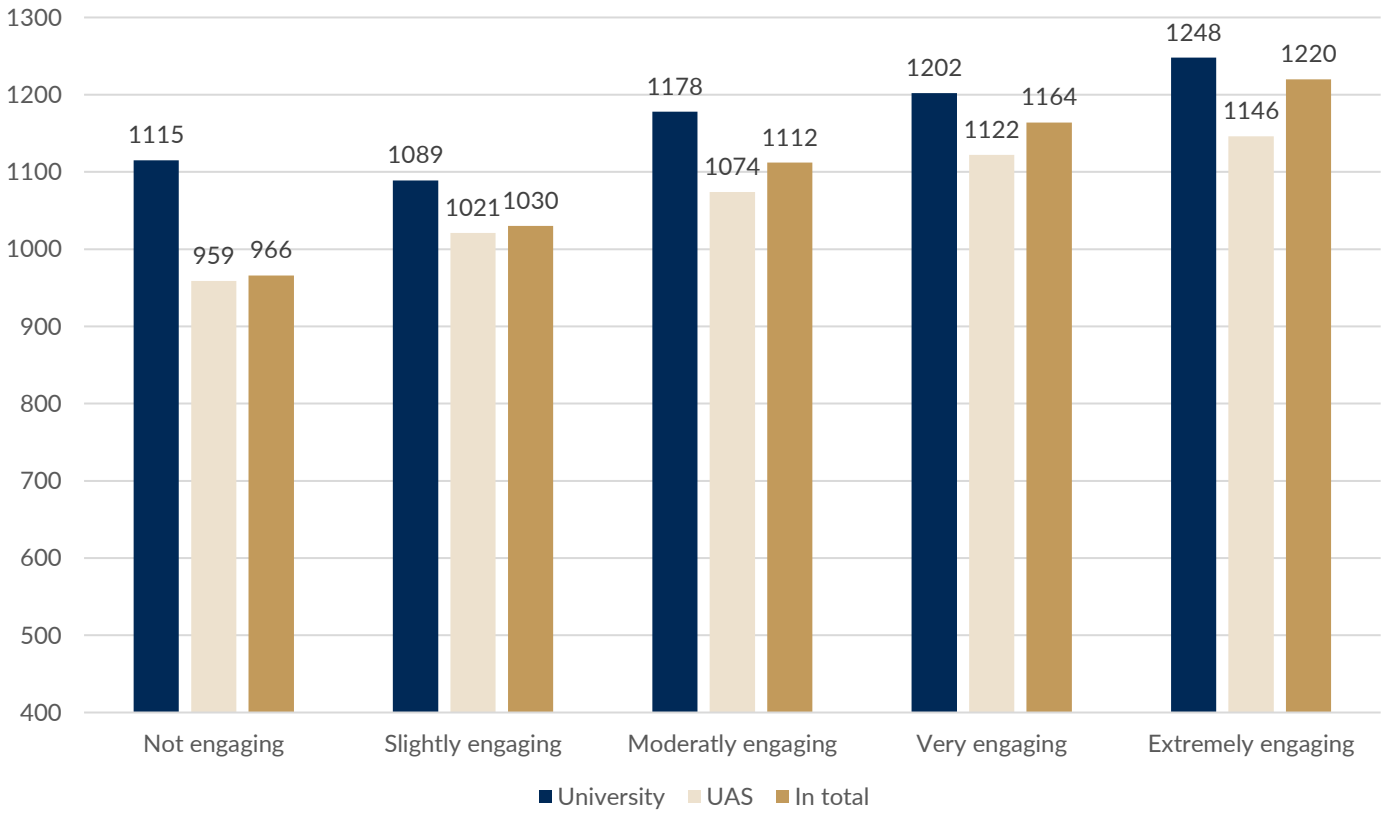
	High mastery			Low mastery		
	University	UAS	Total	University	UAS	Total
No effort	0*	0	0	45*	91	82
A little effort	5	4	4	15	42	38
A moderate amount of effort	28	10	16	4	23	17
A lot of effort	58	16	32	5	15	11
My best effort	13	14	13	8	19	14

*n<10

- University participants who indicated substantial effort during the assessment attained the high mastery level.
- Notably, 19% of UAS participants who reported putting forth their best effort still ended up at the low mastery level.

Engagement and CLA+ mean scores

- The more engaging the test tasks were perceived to be, the higher the scores participants achieved.
- The difference between those who found the test tasks extremely engaging and those who found them not engaging at all was 254 points.



Participants' mastery levels by engagement of test tasks (%)

	High mastery			Low mastery		
	University	UAS	Total	University	UAS	Total
Not engaging	0*	3	3	0*	47	45
Slightly engaging	20	6	8	13	34	31
Moderatly engaging	32	12	19	4	18	13
Very engaging	47	19	33	7	11	9
Extremely engaging	71*	49	65	0*	14	4

*n<10

- Participants—particularly those from universities—who found the test tasks engaging attained the high mastery level.
- Almost half of UAS participants who reported the test tasks as not engaging ended up at the lowest mastery level.

Predictors of first-year students' generic skills

- Multiple regression analyses were conducted to examine the relationships between CLA+ scores and background variables.
- The strongest explanatory factors identified were:
  - native language grade in the matriculation examination,
  - effort in test-taking,
  - type of HE institution,
  - engagement in the CLA+ test, and
  - number of books in the childhood home.

	Beta	SE	β	p
UAS (vs. university)	**-48,1**	**12,8**	**-0,15**	**<,001**
Field of study				ns
Age	8,4	2,9	0,08	<,01
Gender				ns
Matriculated				ns
Native language grade	**26,9**	**2,2**	**0,39**	**<,001**
Parental education				ns
Number of books at childhood home	**11,7**	**2,4**	**0,10**	**<,001**
Engagement	**21,4**	**4,6**	**0,11**	**<,001**
Effort	**52,9**	**6,5**	**0,23**	**<,001**

R^2=41%

Closing reflections and questions

- **Despite 11–12 years of formal education, half of incoming HE students struggle with critical thinking and argumentation**. While many demonstrate solid skills, the **overall proficiency gap remains significant**.
- Key questions to consider:
  - How can students be better prepared before entering higher education?
  - To what extent should generic skills be integrated into primary and secondary education, especially in vocational upper secondary education?
  - What role should learning environments outside the formal school system play?
  - What strategies should HE institutions adopt to foster the development of generic skills essential for academic success and future careers?
  - How can students be encouraged and motivated to learn generic skills in an AI-driven world?
- Generic skills should be recognized as fundamental competencies vital to all areas of life across the lifespan—not simply as instruments for education, employment, or as trendy intergovernmental jargon.

KIITOS!

https://www.jyu.fi/fi/ktl/tutkimus/kappas

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Microsoft Copilot was used to polish the language of the presentation.