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DIGIWELL

DIGITAL WELL-BEING
IN HIGHER EDUCATION

Transilvania
University
of Brasov

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FH·W·S
University of Applied Sciences
Würzburg-Schweinfurt

VID

To cite this report:

Cazan, A.M. et al. (2023). *Factors affecting digital well-being – An international perspective*. Transilvania University of Brasov.
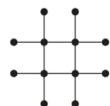
R1. Quantitative study

Factors affecting digital well-being –
An international perspective.
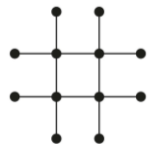
Aims & Research questions

To analyze the way in which the extensive use of technology and personal factors explain the digital well-being of academics and students.

Q1. What is the impact of the extensive use of technology on the well-being of academics and students?

Q2. What are the factors sustaining digital well-being in academia (does social support, organisational support, inhibitors of technostress, personal resources such as emotion regulation, achievement striving, and self-efficacy contribute to digital well-being)?

Q3. Are there any differences in digital well-being based on country of origin and seniority?
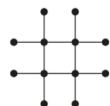
Procedure

Two – parallel online surveys for **academics** (N = 446) and **students** (N = 660) from four European countries:

Romania   Germany   Norway   Finland

Data collection was done between November 2022 – January 2023

Participants

446 Academics

660 students

Participants
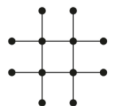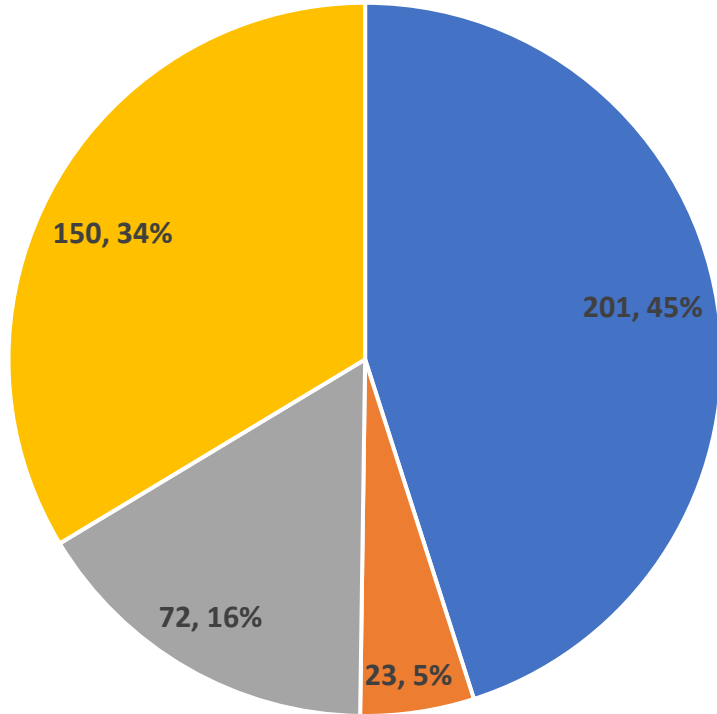
Academic field in academics
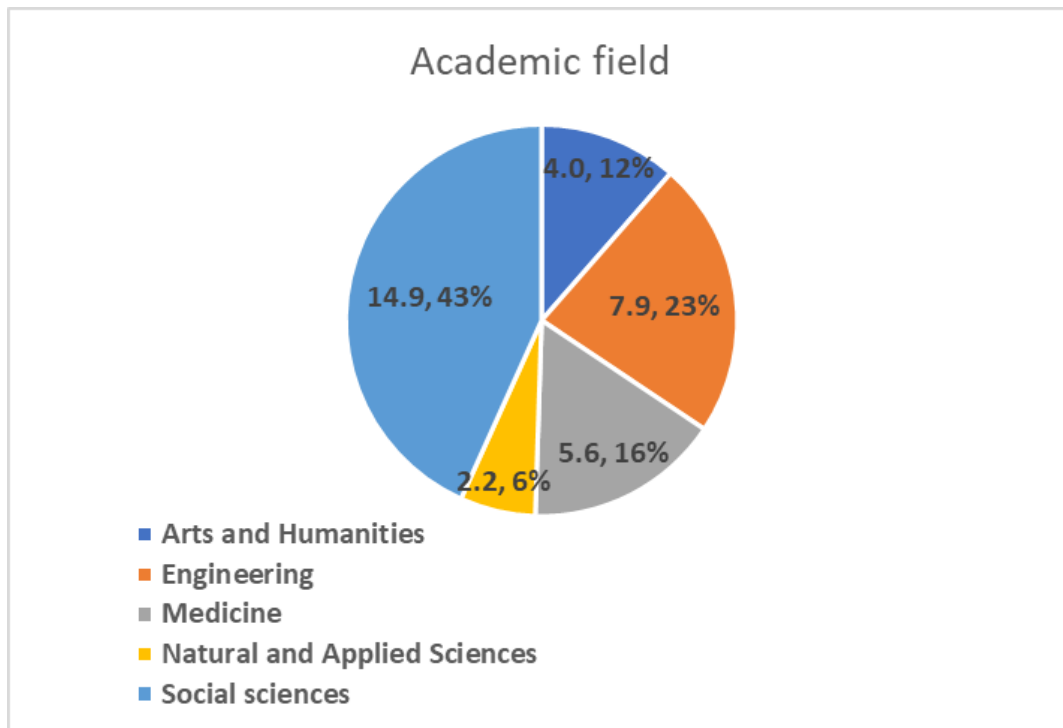
Academic field in students
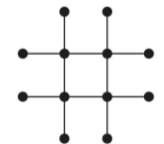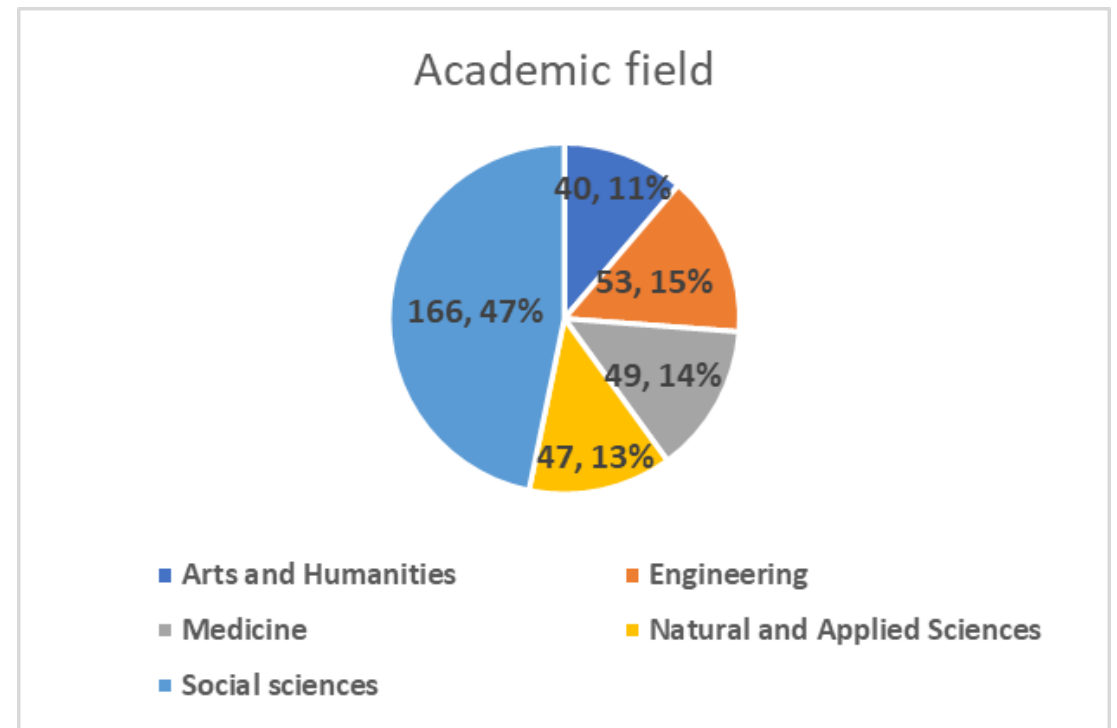
Measures (1)

Use of technology

- **The amount of time spend using technology** for job-related (compulsory and non-compulsory) tasks (*How many hours a day do you spend using technology for: job-related (compulsory and non-job compulsory):Teaching/ Research/ Administrative tasks, weekdays and weekend day and non-job related*); The frequency of use (8 items) and perceptions about optimal use (4 items, *How many hours/day do you regard as an optimal use for job related activities (Teaching/ Research/ Administrative tasks)?*)
- **Frequency of use of specific apps** for academic purposes

Technostress

- **The technostress scale** (Tarafdar et al., 2015): Techno-overload Techno-invasion (4 items, α = .81), Techno-complexity.
- **The Technostress Inhibitors Scale** (Tarafdar et al., 2015): Literacy facilitation (5 items), Technical support provision (4 items), Involvement facilitation (4 items).

Well-being

- **The PERMA Profiler** (Butler & Kern, 2016): Positive emotions, Engagement, Relationship, Meaning, Acomplishment

Measures (2)

Personal resources

- **The Emotion Regulation Scale** (Gross & John, 2003): Cognitive reappraisal (6 items, Cronbach's Alpha = .58) and Expressive suppression (4 items).
- **The Achievement Striving Scale** (Goldberg et al., 2006) (10 items)
- **The technology self-efficacy scale** (Gu et al., 2013), (Venkatesh et al., 2003) (5 items)
- **Social support –** *'How often do you get help and support from your colleagues?'* and *'How often do you get help and support from your nearest superior?'* (Pejtersen et al., 2010).
- **Formal and informal rules, expectations, policies, punishments, and rewards about the use of technology** (Piszczek, 2017): communications that occur outside your regular working hours (5 items,) and expectations about availability (8 items).

Sociodemographics: country of origin, gender, age, academic position, seniority
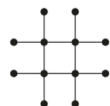
Results (1)

Use of technology for academic purposes
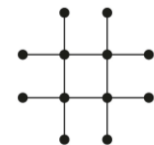
Use of technology: effective vs. optimal use

Academics

Effective vs. Optimal use during weekdays
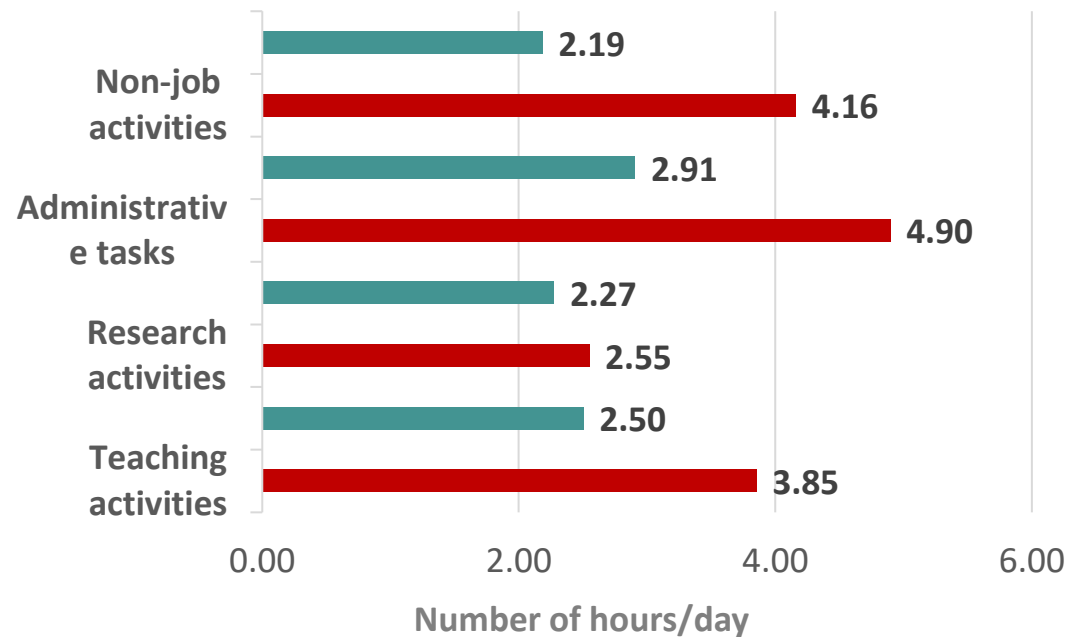
Students

Effective vs. Optimal use during weekdays
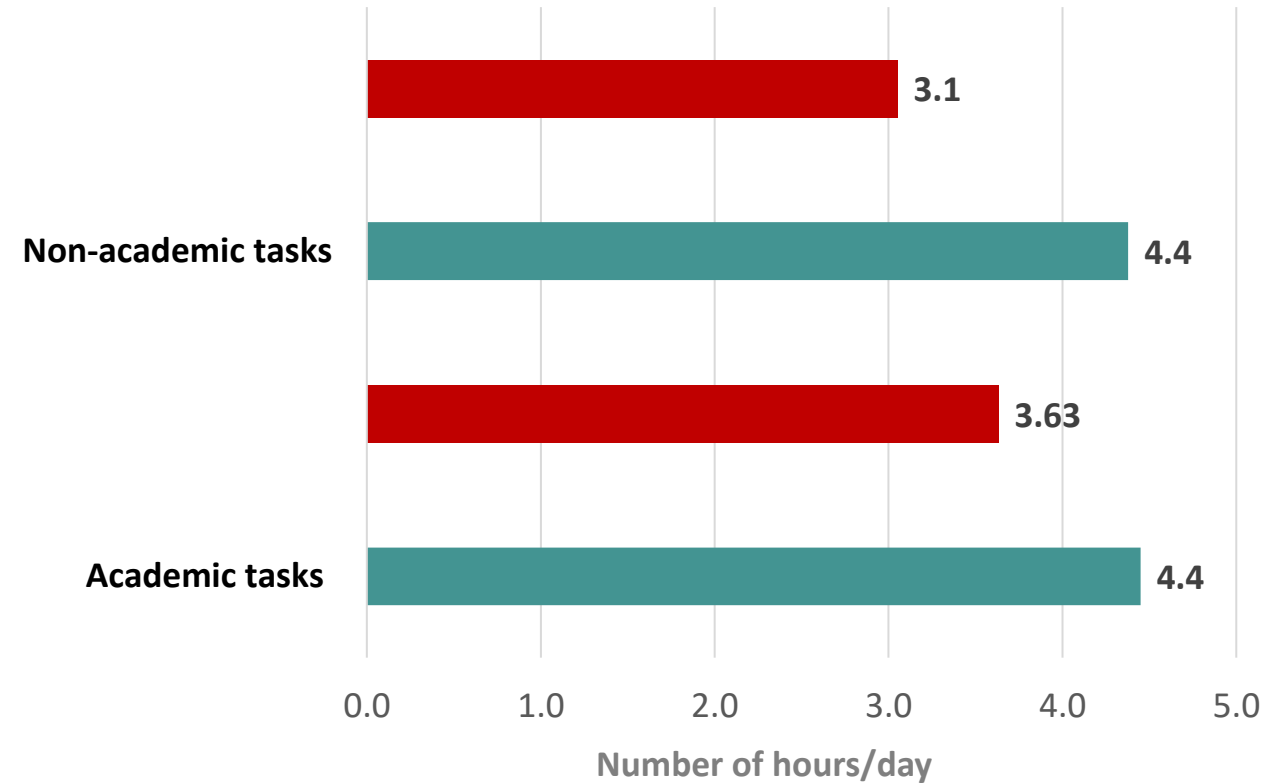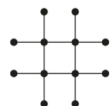
Use of technology: effective vs. optimal use

Academics

Perceive the effective use of technology as significantly **higher** than the optimal use for Administrative tasks, Teaching activities, Non-Job Activity

For Research activities, there aren't any significant differences between effective and optimal use

The larger differences are for administrative tasks (this may be due to the respondents' perception that a teacher should only teach) and non-teaching activities.

Students

Perceive the effective use of technology as significantly **higher** than the optimal use both for academic and non-academic tasks

Use of technology after hours

Academics   **Students**

How many work-related demands did you (1) received, (2) responded, (3) intiated after hours in an average week?
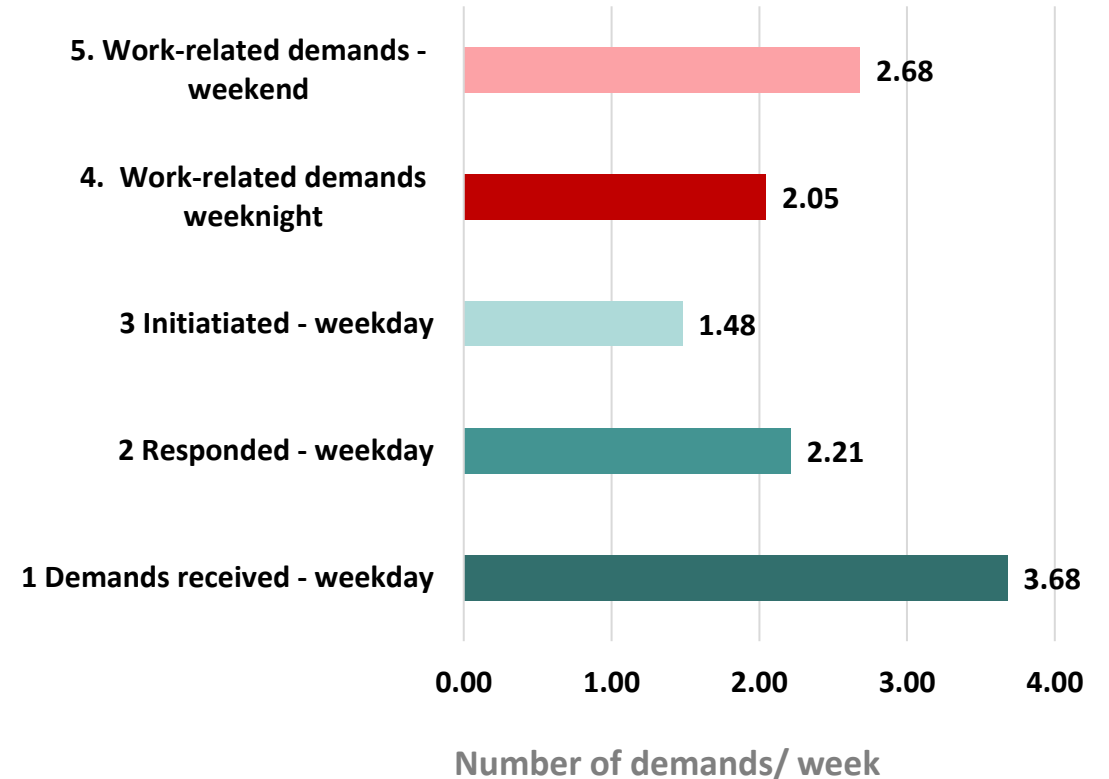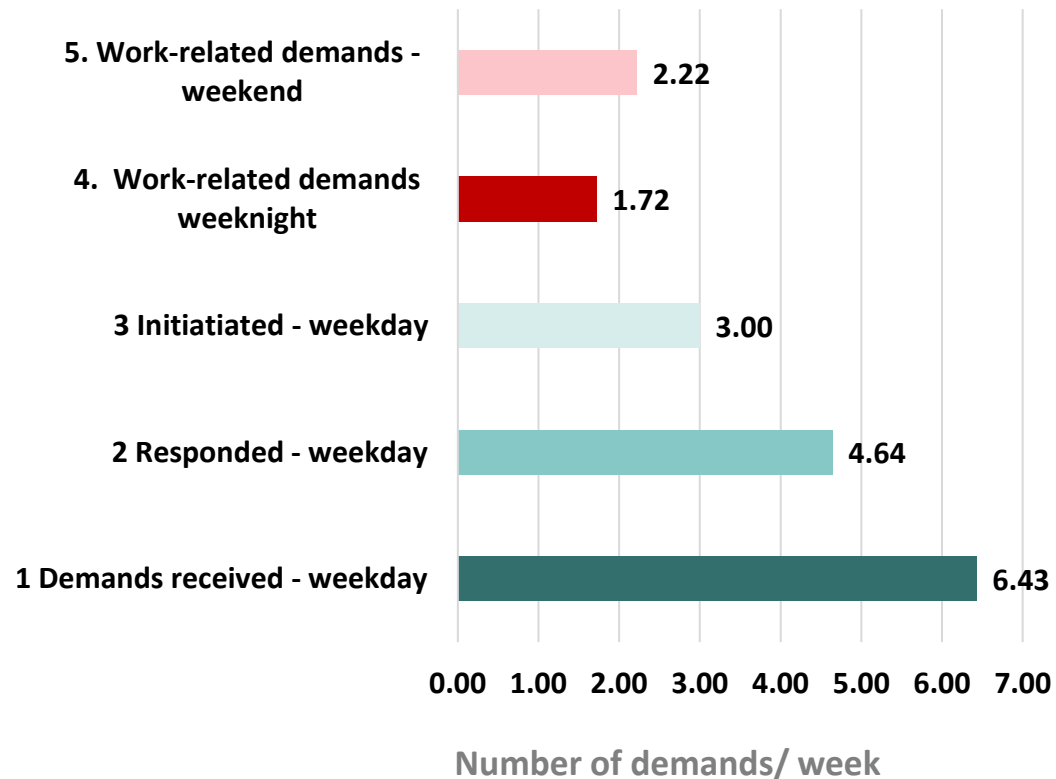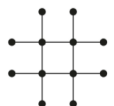
Use of technology during weekend
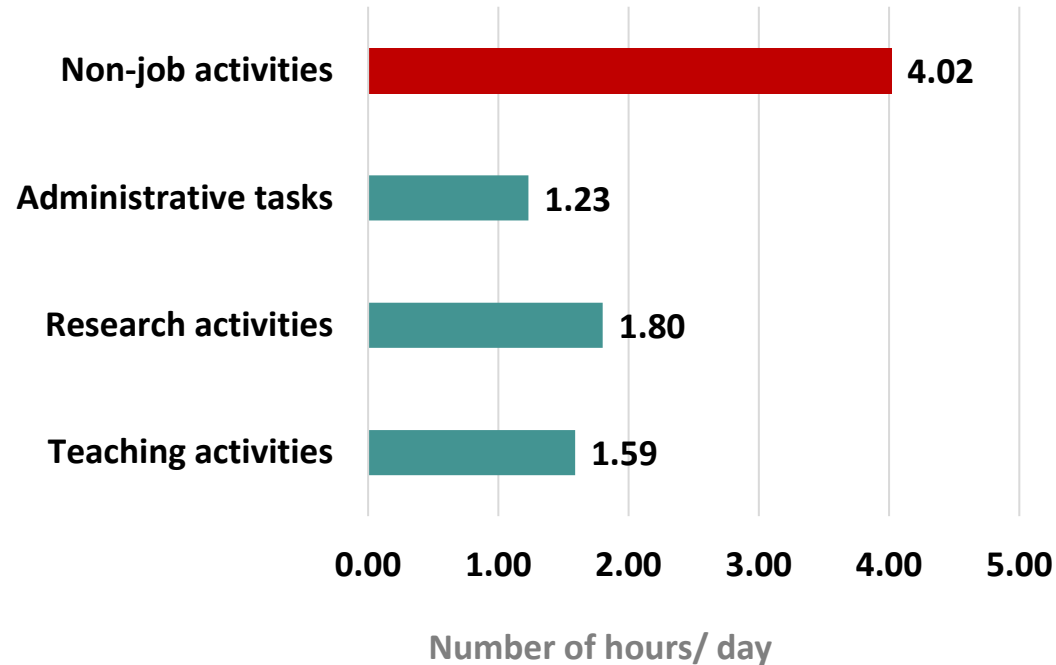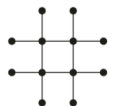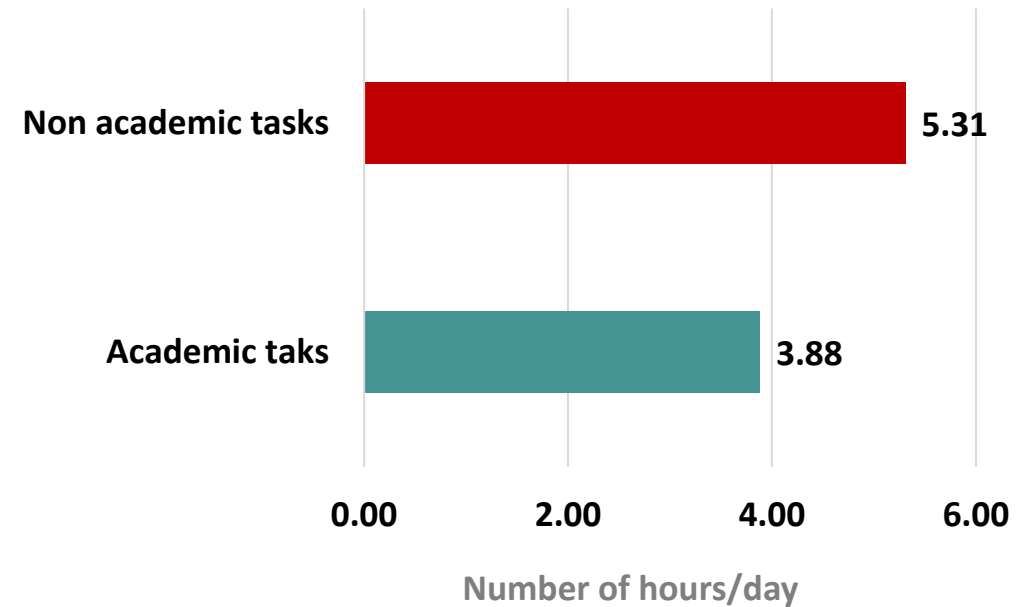
Use of technology during weekdays & weekend

- Both **academics** and **students** use technology for academic-related purposes after hours or during weekends

- The number of received demands after hours is significantly **higher** than the solved and initiated demands,

- For both academics and students, the number of responded demands is **higher** than the number of initiated demands.

- During weekdays, teachers report they manage significantly more work-demands than students, while students seam to postpone some of them for weekends and weeknights.

- Both **academics** and **students** use technology significantly **higher** for non-job/non-academic activities

Use of apps and digital technology

Academics

Category	Value
E-learning applications (Moodle,…	2.69
Professional social networks…	1.43
Professional social networks…	2.05
Online social networks for research…	1.65
Source code management…	0.28
Brainstorming, mind mapping,…	0.88
University-level social network…	0.47
Video collaboration (Zoom, Teams,…	2.73
Communication/chat applications…	0.69
Project management applications…	0.59
Online document management…	3.01
Email	3.82
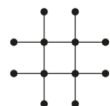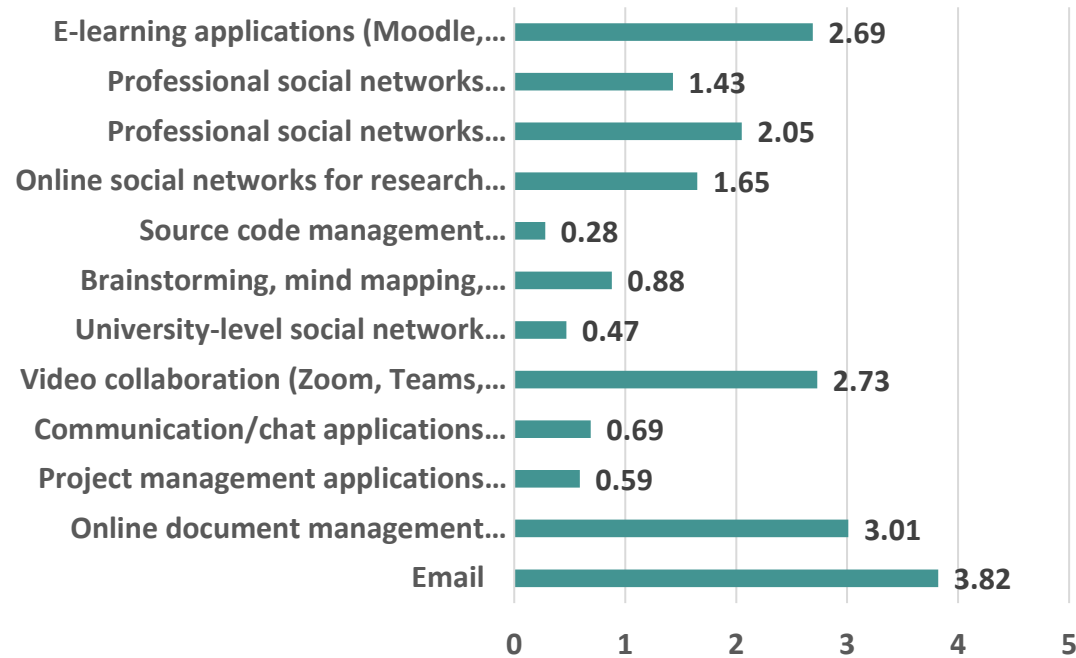
Frequency of use (0 = never, 5 = daily)

Students

Category	Value
E-learning applications (Moodle,…	2.76
General social networks (Facebook,…	3.37
Online social networks for research…	1.65
Source code management applications…	0.5
Brainstorming, mind mapping,…	1.04
University-level social network…	0.65
Video collaboration (Zoom, Teams,…	2.44
Communication/chat applications with…	0.71
Project management applications…	0.45
Online document management…	2.86

Frequency of use (0 = never, 5 = daily)

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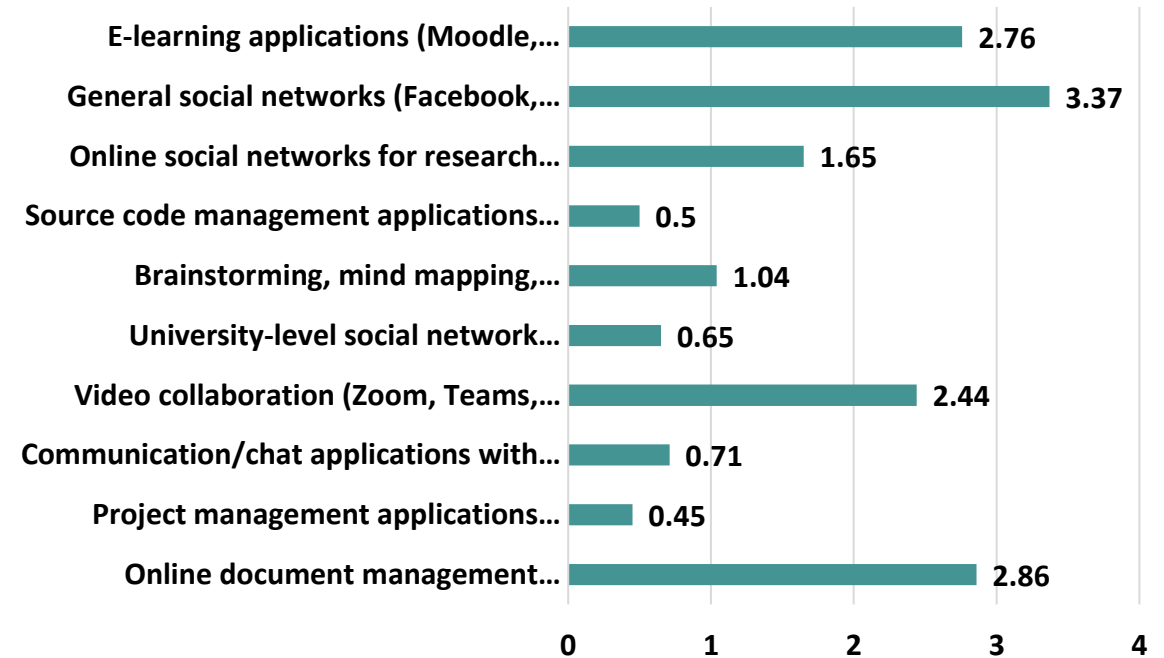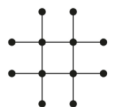
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Use of apps and digital technology

Academics

TOP 3 used apps for academic purposes

1. Email
2. Online documents management tools
3. Video collaboration apps

Students

TOP 3 used apps for academic purposes

1. General social networks
2. Online documents management tools
3. E-learning apps
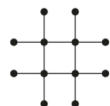
Use of apps and digital technology

- University-level networking apps and project management apps are not very popular among either academics or students.

- Communication is the main aim for using apps and digital technology both by academics and students, followed by managing documents.
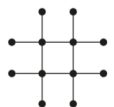
Results (2)

Technostress and use of technology in academics and students

What is technostress?

- „an inability to cope with new technologies in a healthy manner" (Ragu-Nathan, 2008)

- is generated by:

An individual's **_inexperience with computers or technology_**

A **_lack of training_** or sufficient training with new technologies

An _overworked_ staff or understaffed workplace

Information overload

A quickened **_pace of change_** in technology

Intimidation regarding jargon and computer language

The presence of **_multiple technology interfaces_**

Performance anxiety with regards to technology use

Associations between technostress and use of technology in ACACEMICS

	Techno stressors				Techno inhibitors			
	Overload	**Invasion**	**Complexity**	**Total**	**Literacy**	**Support**	**Involvement**	**Total**
Use of technology for... (during weekdays)								
Teaching activities -	.239**	.015	.051	.146*	.134	.216**	.011	.155*
Research activities	-.028	.109	.030	.038	-.060	.084	-.045	-.008
Administrative tasks	.078	-.066	.113	.047	-.218**	.022	-.142*	-.138
Use of technology for... (during weekend)								
Teaching activities	.099	.110	.086	.122	.191**	.229**	.063	.204**
Research activities	-.065	.095	-.051	-.010	.048	.090	.030	.069
Administrative tasks	.054	.138*	.076	.107	-.210**	-.067	-.176*	-.182**

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

Associations between technostress and use of technology in STUDENTS

	Techno stressors				Techno inhibitors			
	Overload	Invasion	Complexity	Total	Literacy	Support	Involvement	Total
Use of technology for… (during weekdays)								
Academic activities	-.024	.104*	-.076	.010	-.010	.034	-.032	-.005
Non-academic activities	-.153**	-.119*	-.057	-.146**	.025	.048	-.029	.029
Use of technology for… (during weekend)								
Academic activities	.024	.175**	.030	.098	.040	-.067	-.042	-.022
Non-academic activities	-.111*	-.108*	-.027	-.111*	-.013	-.043	-.068	-.038

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

Associations between technostress and use of technology in ACADEMICS

	Techno stressors				Techno inhibitors			
	Overload	Invasion	Complexity	Total	Literacy	Support	Involvement	Total
Time you spent on the average weekday engaged in….								
Received demands	.180*	.154*	.080	.181*	-.042	.006	.018	-.011
Responded demands	.120	.202**	.128	.182*	-.068	.019	-.009	-.027
Initiated demands	.154*	.169*	.190**	.204**	-.059	.046	.023	-.001
Time you spent on the average weeknight engaged in….								
Work related demands	.233**	.263***	.068	.250***	-.058	.017	-.011	-.023
Time you spent on the average weekend engaged in….								
Work related demands	.116	.276***	.052	.189**	.015	.077	.010	.042

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

Associations between technostress and use of technology in STUDENTS

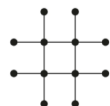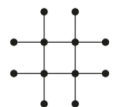|	Techno stressors				Techno inhibitors			
	Overload	Invasion	Complexity	Total	Literacy	Support	Involvement	Total
Time you spent on the average weekday engaged in….								
Received demands	.107*	.119*	.063	.126*	-.009	-.028	-.014	-.020
Responded demands	.059	.131*	.081	.113*	.058	.018	.105*	.070
Initiated demands	.045	.085	.134*	.103	.099	.021	.129*	.100
Time you spent on the average weeknight engaged in….								
Univ. related demands	.043	.124*	.128*	.117*	.061	.022	.065	.059
Time you spent on the average weekend engaged in….								
Univ. related demands	.046	.103	.121*	.107*	.065	.004	.088	.064

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

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Associations between technostress and use of technology

Academics

Perceive use of technology for teaching activities as being a form of techno-overload, while performing administrative tasks during weekends as an invasion.

Perceive work demands as being invasive during weekdays, but also weeknights or weekends. The demands are perceived as overload during weeknights.

Perceive that for the teaching activities they benefit from technical support provision whereas for administrative tasks, they lack the necessary literacy.

Students

Perceive academic tasks in weekdays and weekends as invasion while non-academic activities have a negative correlation with techno-stress (they may use technology for recreation purposes).

See academic demands as invasive and overload during weekdays and weeknights, but not as much in weekends.

Results (3)

Technostress and well-being

Associations between technostress and well-being Academics

Well-being dimensions	Techno Overload	Techno Invasion	Techno Complexity	Technostress creators Tot	Literacy Facilitation	Technical Support	Involvement Facilitation	Technostress inhibitors
Positive emotions	-.253***	-.192***	-.237***	-.280***	.318***	.349***	.217**	.362***
Engagement	-.194**	-.080	-.225***	-.199**	.249***	.244***	.219**	.288***
Relationships	-.238**	-.246***	-.209**	-.285***	.307***	.299***	.236**	.342***
Meaning	-.225**	-.169*	-.147*	-.229**	.238**	.301***	.179*	.293***
Accomplishment	-.247***	-.207**	-.227**	-.280***	.199**	.349***	.165*	.290***
Negative emotions	.209**	.216**	.144*	.239**	-.216**	-.209**	-.129	-.229**
Health	-.181**	-.139*	-.262***	-.227**	.179*	.318***	.075	.239**
Overall well-being	-.289***	-.224**	-.257***	-.317***	.327***	.382***	.249***	.390***

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

Associations between technostress and well-being
Academics

- All technostress creators – technology overload, technology invasion and technology complexity – negatively correlate with well-being and its dimension which means that …

  - *Academics who experience high levels of stress due to overload, invasion and complexity of technologies in their work also experience fewer positive emotions and stronger negative ones, lower engagement and feelings of accomplishment and meaning in their works, and tend to be less satisfied with their relationships*

- Technostress inhibitors – like literary facilitation and technical support - are positively correlated with well-being and can be a buffer when facing stress
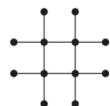
Associations between technostress and well-being Students

Well-being dimensions	Techno Overload	Techno Invasion	Techno Complexity	Technostress Creator Tot	Literacy Facilitation	Technical Support	Involvement Facilitation	Technostress inhibitors
Positive emotions	-.106*	-.194***	-.161**	-.188***	.270***	.177**	.224***	.259***
Engagement	-.079	-.132*	-.130*	-.138**	.270***	.155**	.197***	.244***
Relationships	-.057	-.166**	-.172**	-.156**	.185***	.143**	.125*	.173**
Meaning	-.013	-.104*	-.154**	-.101	.183***	.125*	.151**	.174**
Accomplishment	-.087	-.149**	-.121*	-.147**	.233***	.174**	.184***	.225***
Negative emotions	.056	.231***	.136**	.172**	-.062	-.063	-.174**	-.107*
Health	-.029	-.066	-.089	-.071	.115*	.134**	.131*	.146**
Overall well-being	-.072	-.174**	-.173**	-.166**	.263***	.180***	.204***	.248***

Note: Associations were tested using Pearson correlation
*** $p < .001$, ** $p < .01$, *$p < .05$

Associations between technostress and well-being Students

- Technology invasion and technology complexity negatively correlate with well-being and its dimension which means that …

  - *Students who experience high levels of stress due to invasion and complexity of technologies in their lives also experience fewer positive emotions and stronger negative ones, lower engagement and feelings of accomplishment and meaning in their works, and tend to be less satisfied with their relationships*

- Health does not seem to be related to technostress

- Technostress inhibitors – like literary facilitation and technical support - are positively correlated with well-being and can be a buffer when facing stress for students, too

Results (4)

Technostress and personal resources
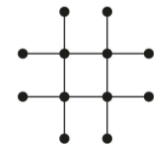
Associations between technostress and personal resources in ACADEMICS

Personal resources	Techno stressors				Techno inhibitors			
	Overload	Invasion	Complexity	Total	Literacy	Support	Involvement	Total
Achievement striving	-.081	.015	-.125	-.072	.056	**.176***	.086	.127
Technology self-efficacy	**-.377*****	**-.223*****	**-.569*****	**-.452****	**.221****	**.235****	**.101**	**.233****
Availability	-.054	**307*****	.065	.114	.012	.096	-.076	.021
Cognitive reappraisal	-.016	.031	-.037	-.006	.020	.033	-.006	.021
Expressive suppression	-.007	-.010	-.025	-.015	.065	.088	.075	.091

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05
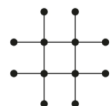
Associations between technostress and personal resources in STUDENTS

Personal resources	Techno stressors				Techno inhibitors			
	Overload	**Invasion**	**Complexity**	**Total**	**Literacy**	**Support**	**Involvement**	**Total**
Achievement striving	-.006	.039	**-.107***	-.020	.060	.088	**.117***	.095
Technology self-efficacy	**-.338*****	**-.119***	**-.505*****	**-.378****	**.127***	**.160****	**.052**	**.136****
Cognitive reappraisal	**.176****	**.129***	**.164****	**.196*****	.080	.025	**.168****	**.103***
Expressive suppression	.093	.059	.093	**.102***	.076	.000	**.143****	.080
Emotional regulation total	**.152****	**.108***	**.145****	**.169****	.085	.015	**.170****	.101

Note: Associations were tested using Pearson correlation
*** p < .001, ** p < .01, *p < .05

Associations between technostress and personal resources

- **Technology self-efficacy** correlates with techno-stressors and techno-inhibitors in **academics** and **students** and seems to be one of the most relevant personal resources in coping with technostress and extensive use of technology

- **Achievement striving** is negatively associated with technology complexity and positively associated with technology involvement for **students**

- **Cognitive reappraisal** as an attempt to manage the meaning of a situation is used by **students** in relation with techno-stressor creators as a strategy to reduce distress
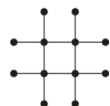
Results (5)

Technostress: Country differences and sociodemographics

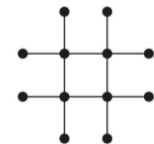| Country	M	SD
General well-being F(3,228) = 4.002, p <.001		
Romania	7.83	1.40
Germany	6.95	1.32
Finland	7.56	1.51
Norway	7.16	1.40
Techno creators F(3,228) = 1.586, p = .194		
Romania	2.46	.86
Germany	2.86	.69
Finland	2.73	.53
Norway	2.65	.84
Techno overload F(3,228) = 7.075, p <.001		
Romania	2.38	1.03
Germany	3.18	1.06
Finland	3.22	.82
Norway	2.82	.98
Techno inhibitors F(3,228) = 5.337, p <.001		
Romania	3.33	.82
Germany	3.00	.40
Finland	3.41	.65
Norway	2.89	.63
Literacy facilitation F(3,228) = 4.649, p =.004		
Romania	3.42	1.00
Germany	2.78	.62
Finland	3.51	.84
Norway	2.98	.70

← ACADEMICS

Country differences Academics

Ro & Fi report the highest levels of WB
Ge & FI report the highest levels of techno overload

Country differences Students

Fi & Ro report the highest levels of WB
Ge & No report the highest levels of techno overload

STUDENTS →

Country	M	SD
General well-being F(3,422) = 1.741, p =.158		
Romania	6.98	1.84
Germany	6.36	1.44
Finland	7.06	1.59
Norway	6.70	1.78
Techno creators F(3,422) = 1.659, p =.176		
Romania	2.77	.75
Germany	2.94	.82
Finland	2.62	.75
Norway	2.88	.69
Techno overload F(3,422) = 3.795, p =.011		
Romania	2.71	.90
Germany	3.11	.88
Finland	2.90	.98
Norway	3.06	.69
Techno invasion F(3,422) = 3.696, p < .001		
Romania	3.16	.98
Germany	3.24	.98
Finland	2.69	.99
Norway	3.04	.95
Techno inhibitors F(3,422) = .896, p =.443		
Romania	3.11	.73
Germany	2.98	.61
Finland	3.22	.48
Norway	3.08	.64

Supplementary data on technostress and demographics

ACADEMICS	Work experience	Work experience in university
Techno stressors	**.145***	.040
Techno overload	.083	-.030
Techno invasion	.066	.076
Techno complexity	**.260****	.090
Technostress inhibitors	-.040	.036
Literacy facilitation	-.070	-.005
Technical support	.028	**.179***
Involvement facilitation	-.059	-.108

STUDENTS	Academic standing
Techno stressors	-.035
Techno overload	-.021
Techno invasion	.004
Techno complexity	-.082
Technostress inhibitors	**-.120***
Literacy facilitation	**-.143****
Technical support	-.033
Involvement facilitation	**-.112***
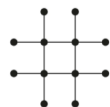
Conclusions (1)

Both academics and students perceive the effective number of hours spend using technologies for academic purposes as being higher than the optimal use of technology.

Academics report using technologies for academic purposes after hours or during weekends, especially for work-related demands during weeknights and weekends. They seems to be constantly connected to emails, no matter time of day or week.

Using new technologies for teaching activities is associated with perception of greater technology overload by academics.
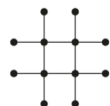
Having technical support from the organization and having strong beliefs in one own's ability to use technology are the most relevant resources in coping with technostress and maintaining digital well-being.

Conclusions (2)

Students report using technology for solving academic tasks frequently during weekends (with a mean of 5.38 hours/day). In general, they mostly use general social networks even for academic purposes.

Students perceive use of technology for academic purposes as a form of technology invasion in their lives. This technology invasion seem to have significant impact on students' levels of well-being. Surprisingly, use of technology for non-academic purposes is not perceive as such.
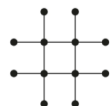
Technology self-efficacy, technology literacy facilitation and involvement (opportunities to develop and use technology skills) are the most relevant resources in coping with technostress and maintaining digital well-being.

Conclusions (3)

Unfinished tasks at the end of the work week are associated with lower levels of detachment at the intraindividual level, which tend to associate with lower relaxation, but not with autonomy and mastery and they also impede on successful recovery during the weekend (Weigelt, & Syrek, 2017).

One of the reasons for academics working during the weekend, instead of relaxing, is that mastery experiences, as well as getting in a flow state are positively associated with being recovered from tiredness at the beginning of the work week as they contribute to an increased level of resources (Binnewies, Sonnentag, & Mojza, 2010).

However, working for long periods of time is associated with deteriorating mental health, mainly in the form of an increased risk of depressive disorders (Sato, Kuroda, & Owan, 2020).
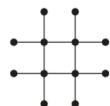
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