



We've added beliefs to the SELFIE. This is what happened

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Euregio Meuse-Rhine

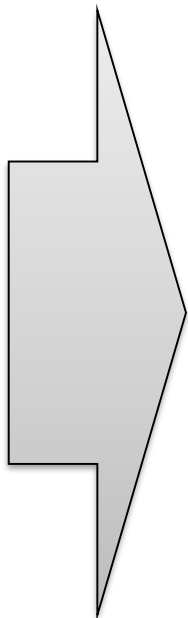
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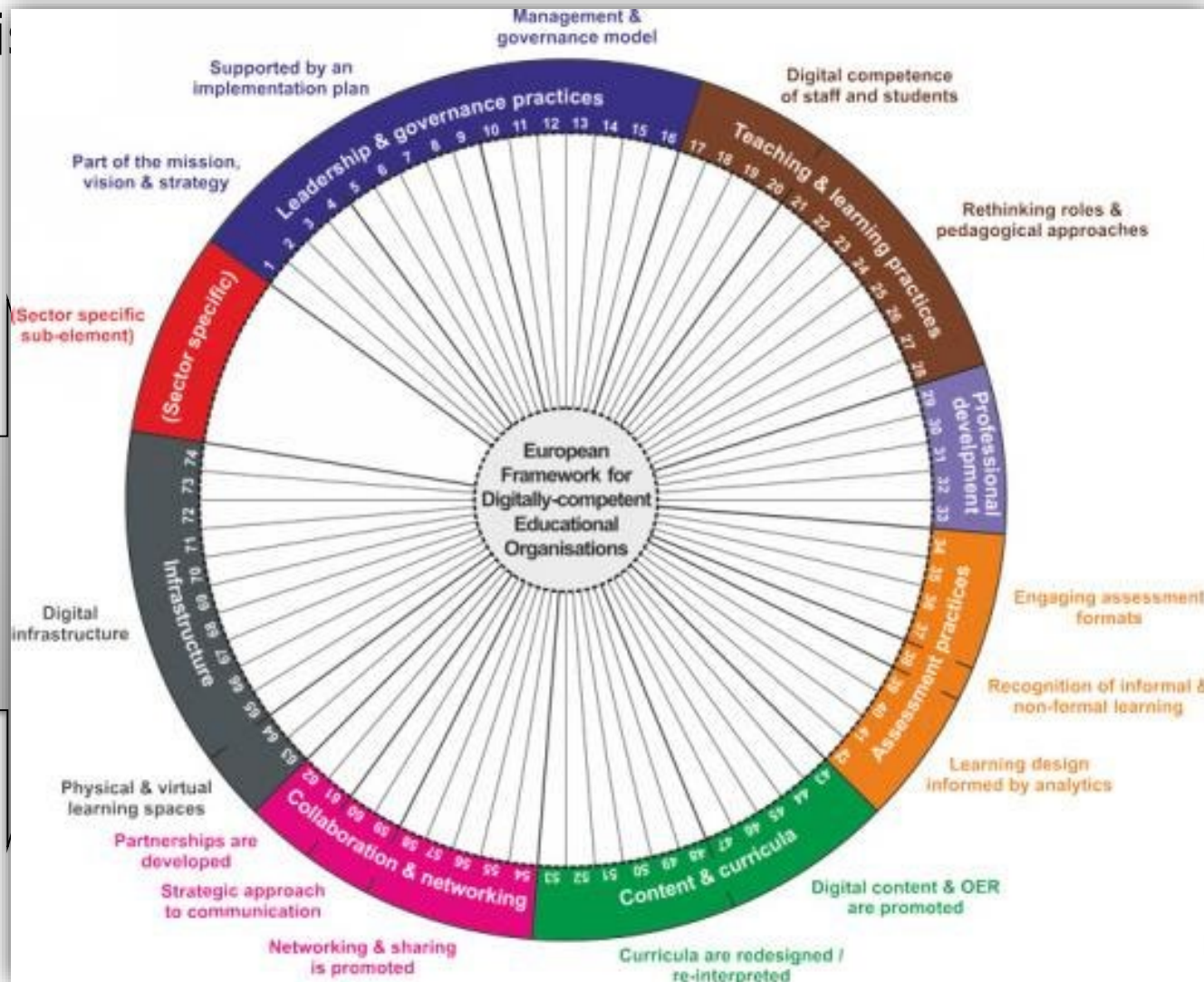
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Digitalisation of education – focus on two aspects

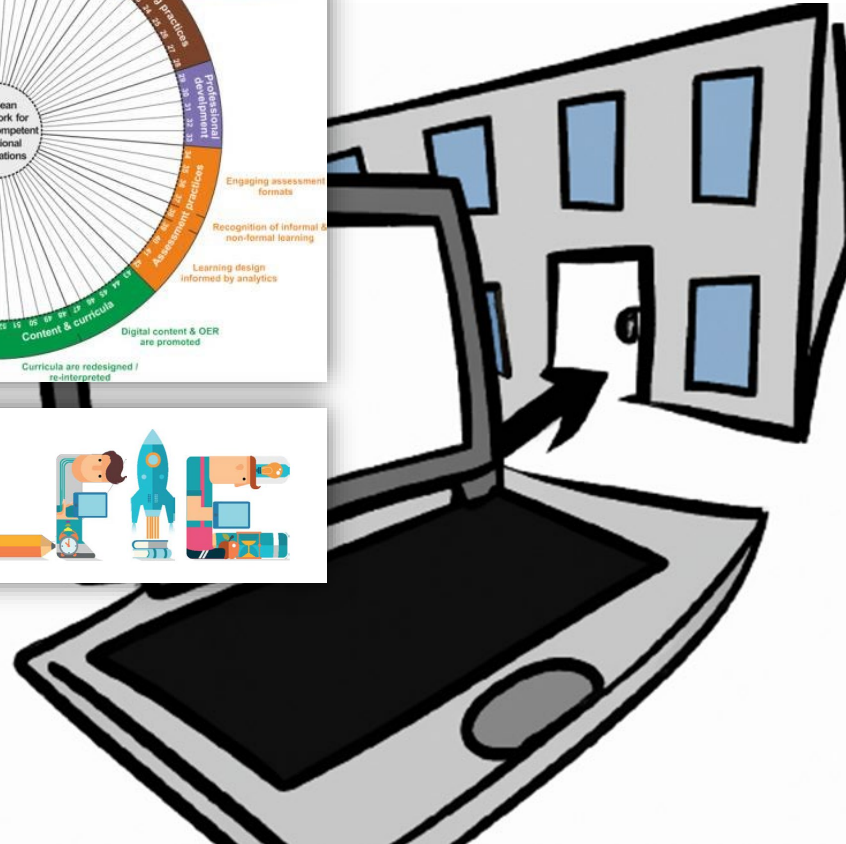
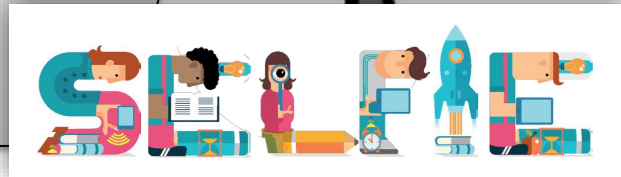
Organisational aspect



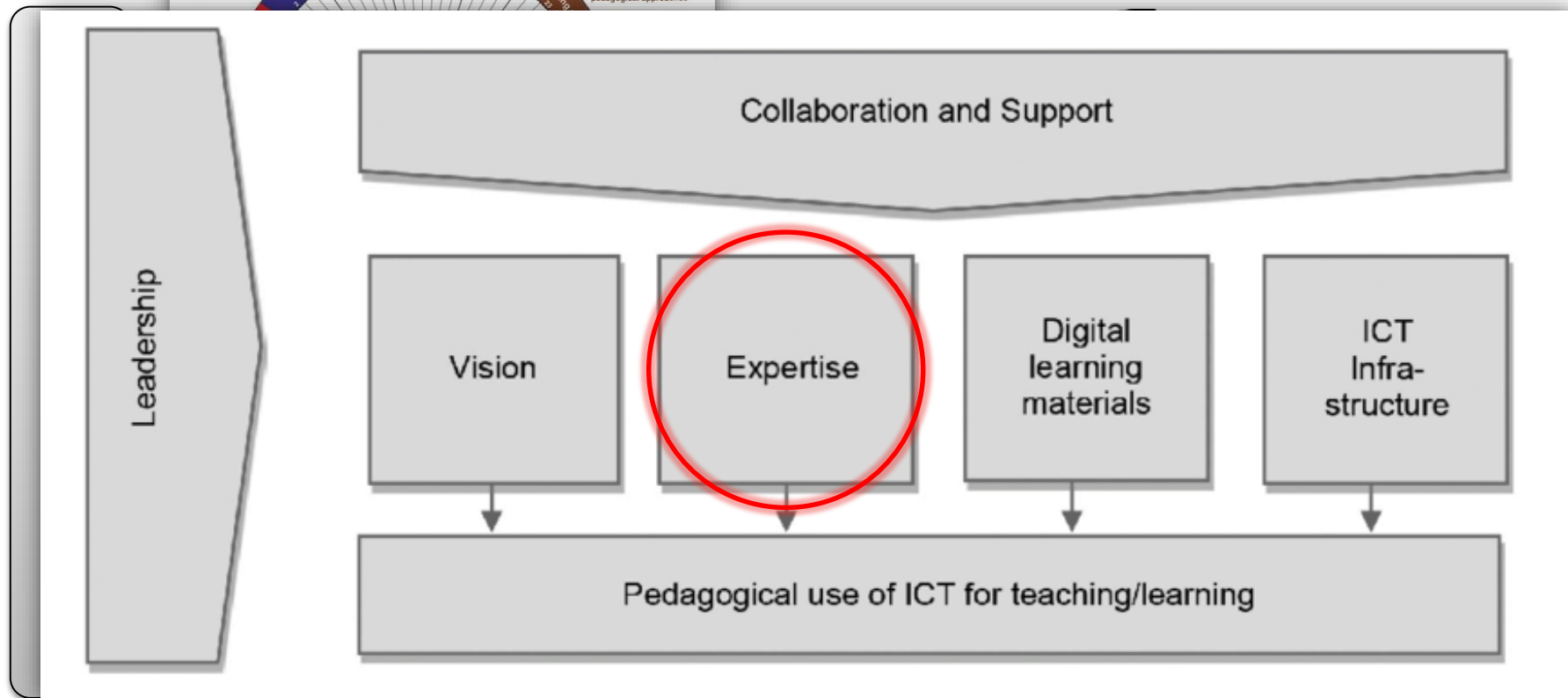
Organisational aspect



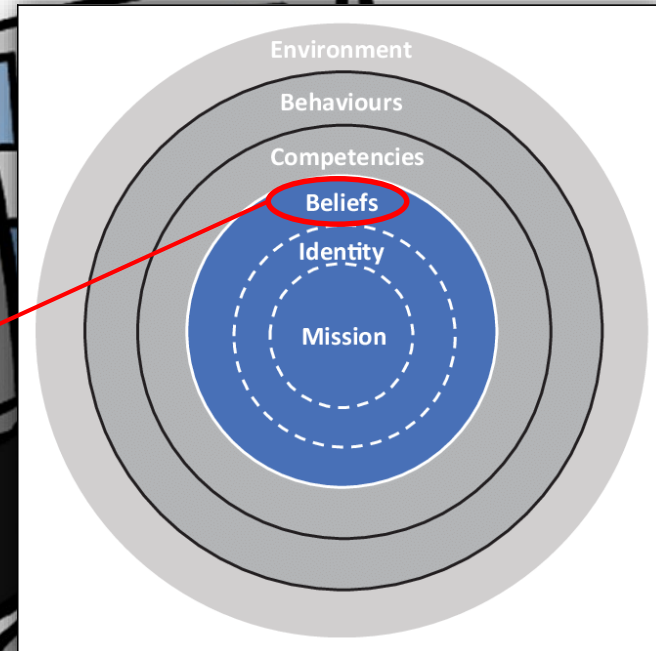
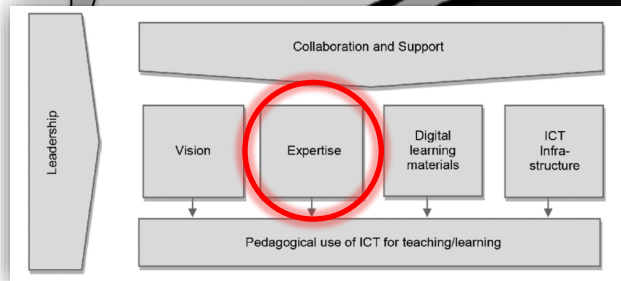
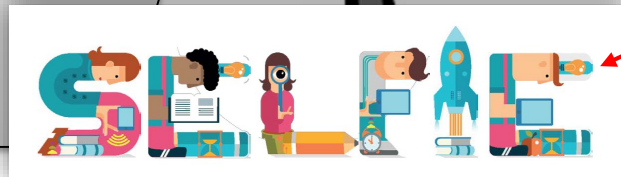
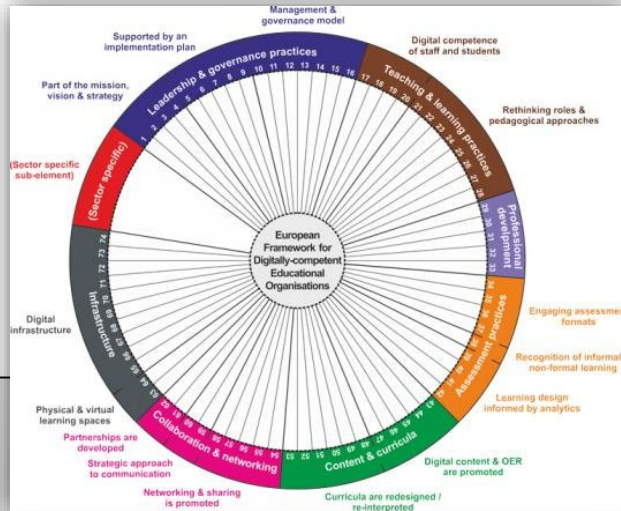
Organisational aspect



Digitalisation of education – focus on two aspects



Digitalisation of education – focus on two aspects



Organisational aspect

Human capital

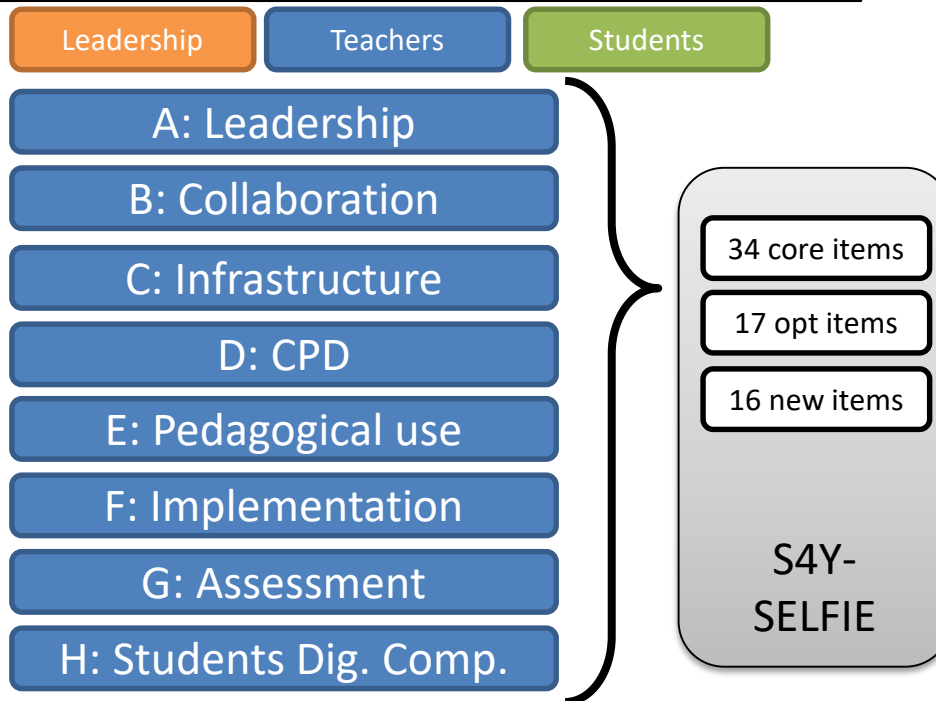
Research purpose and questions

- Explore the potential use of teachers' and students' technology beliefs in education as a partial indicator for the organization of digital education.
- Does the proposed dimension "beliefs" provide accurate information on the digital capacity of schools?

Methodology: S4Y-SELFIE



- Validated instrument developed by European Commission
- Measures the digital capacity of an educational organisation
- Based on DigCompOrg-model
- 5-step Likert scale



Preliminary research
+
Literature



Beliefs

Varia

Cases after data cleaning:
Teachers: n = 269
Students: n = 1172

Category	#	Item title	Statement teachers	Statement students
Leadership	A5	Autonomy	Our school leaders support me in making independent choices on how to approach teaching with digital technology	
Collaboration and Networking	B5	Cooperative assistance to teacher	When I'm approached by a colleague with a problem with digital technology, I am able to help	When my teacher is experiencing a problem with digital technology, I am able to help
	B6	Cooperative assistance to student	When I'm approached by a student with a problem with digital technology, I am able to help	When a peer is experiencing a problem with digital technology, I am able to help
	B7	Exchanging experiences	In our school, we share experiences within the school community about teaching and learning with digital technology	
Infrastructure	C14	Online support	In our school, there is a digital platform available where I can find helpful information on teaching with digital technology, such as FAQ-pages, guides, trouble shooting pages, or help forums.	
Beliefs	D1	Digital competency beliefs	I feel confident in using digital technology for teaching	I feel confident in using digital technology for learning
	D2	Perceived usefulness	I am convinced using digital technology improves teaching and learning in our school.	I am convinced using digital technology improves my learning in school.
	D3	Planning attitude	I believe it is meaningful to plan lessons involving digital technology in the classroom	I believe it is meaningful we have lessons with digital technology in the classroom
	D4	Growth mindset*	Digital technology is too challenging for me to use	Digital technology is too challenging for me to use
	D5	Social presence*	I find it difficult to create a social connection with my students when using digital technology	I find it difficult to create a social connection with my teachers and peers when using digital technology
	D6	Lockdown gains	I learned useful applications of digital technology for teaching and learning during lockdown and distance learning	
	D7	Future intentions	I intend to keep using the applications of digital technology I have learned during lockdown and distance learning as part of my regular teaching practice	
Continuing Professional Development	E4	Motivation self	I feel motivated to learn more about teaching with digital technologies	I feel motivated to learn more about digital technologies
	E5	Motivation student	My students feel motivated to learn more about digital technologies	
	E6	Perception of self-efficacy	I take initiative myself to learn and develop the skills needed to teach with digital technologies	I take initiative myself to learn and develop the skills needed to learn with digital technologies
	E7	Information seeking	I seek (new) information on how to teach with digital technologies	I seek (new) information on how to use digital technologies

Methodology validation

- Data imputation (MICE)
- Check SELFIE model (8 dimensions)
 - CFA
 - Robust estimation method (WLSMV)
 - Goodness-of-fit indexes
 - Robust χ^2
 - Comparative Fit Index (CFI)
 - Tucker-Lewis Index (TLI)
 - RMSEA
 - SRMR
 - Reliability test
 - AVE
 - Cronbach's alpha (α) + omega coefficient (ω)

→ Test validity and reliability of sample

Methodology validation

- Validation “Beliefs”-area
 - Method A (teachers):
 - EFA + CFA on “beliefs” construct
 - Test whether construct is valid and reliable
 - Method B (teachers & students):
 - EFA + CFA on all new (16/10) + optional items (17/8)
 - Explore what valuable information can be extracted
- EFA method:
 - KMO and Bartlett’s test of sphericity
 - Principle Component Analysis
 - Internal consistency index (Cronbach’s alpha (α) + omega coefficient (ω))
- CFA method
 - See previous slide

Results



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Validation results – Teachers (method A)

Category	#	Item title	Statement teachers	PCA (1)	PCA (2)	PCA (3)
Beliefs	D1	Digital competency beliefs	I feel confident in using digital technology for teaching	.490	.479	.485
	D2	Perceived usefulness	I am convinced using digital technology improves teaching and learning in our school.	.641	.658	.672
	D3	Planning attitude	I believe it is meaningful to plan lessons involving digital technology in the classroom	.582	.613	.631
	D4	Growth mindset*	Digital technology is too challenging for me to use	.209		
	D5	Social presence*	I find it difficult to create a social connection with my students when using digital technology	.211		
	D6	Lockdown gains	I learned useful applications of digital technology for teaching and learning during lockdown and distance learning	.280	.294	
	D7	Future intentions	I intend to keep using the applications of digital technology I have learned during lockdown and distance learning as part of my regular teaching practice	.554	.557	.526
Continuing Professional Development	E4	Motivation self	I feel motivated to learn more about teaching with digital technologies	.652	.664	.674
	E5	Motivation student	My students feel motivated to learn more about digital technologies			
	E6	Perception of self-efficacy	I take initiative myself to learn and develop the skills needed to teach with digital technologies	.597	.601	.615
	E7	Information seeking	I seek (new) information on how to teach with digital technologies	.581	.588	.608
Total variance explained (cumulative)				47.956	55.679	60.159

Validation results – Teachers (method A)

Table 1. One factor model estimation results for “Beliefs area” using WLSMV estimator.

Items	Estimate	Std.Err.	t-value	Standardized solution
Digital competency beliefs_D1	1.000			0.664
Perceived usefulness_D2	1.291	0.070	18.428	0.857
Planning attitude_D3	1.271	0.070	18.139	0.844
Future intentions_D7	1.054	0.072	14.602	0.700
Motivation self_E4	1.190	0.063	18.900	0.790
Perception of self-efficacy_E6	1.314	0.072	18.180	0.873
Information seeking_E7	1.301	0.070	18.530	0.864
Goodness-of-fit indexes	Robust Chi Square = 3370.070; df= 21 (p=0.000) Comparative Fit Index (CFI) = 0.806 Tucker-Lewis Index (TLI) = 0.708 RMSEA = 0.264 90 percent confidence interval RMSEA: [0.225, 0.304] p-value RMSEA <0.05 = 0.000 SRMR = 0.082			
Scale reliability	Cronbach Alpha = 0.886 Omega = 0.942 Average Variance Extracted (AVE) = 0.644			

Validation results – Teachers (method B)

Category	#	Item title	Statement teachers	PCA
Factor 1: Beliefs				
Beliefs	D1	Digital competency beliefs	I feel confident in using digital technology for teaching	.495
	D2	Perceived usefulness	I am convinced using digital technology improves teaching and learning in our school.	.712
	D3	Planning attitude	I believe it is meaningful to plan lessons involving digital technology in the classroom	.746
	D7	Future intentions	I intend to keep using the applications of digital technology I have learned during lockdown and distance learning as part of my regular teaching practice	.686
Continuing Professional Development	E4	Motivation self	I feel motivated to learn more about teaching with digital technologies	.823
	E5	Motivation student	My students feel motivated to learn more about digital technologies	.731
	E6	Perception of self-efficacy	I take initiative myself to learn and develop the skills needed to teach with digital technologies	.661
	E7	Information seeking	I seek (new) information on how to teach with digital technologies	.662
Factor 2. Condition for digital Learning				
Factor 3. Student Digital Competence 2				
Factor 4. Teacher Digital Competence				
Factor 5. Facilitation of Knowledge Exchange				
Factor 6. Digital assessment				
Total variance explained (cumulative)				57.565

Validation results – Teachers (method B)

Table 2. Estimates using the WLSMV estimation method WLSMV teachers' scale; isolating beliefs scale

Items	Estimate	Std.Err.	t-value	Standardized solution
Motivation self_E4	1.000			0.808
Planning attitude_D3	1.048	0.045	23.445	0.847
Perceived usefulness_D2	1.090	0.044	25.049	0.881
Future intentions_D7	0.860	0.055	15.653	0.695
Information seeking_E7	0.921	0.048	19.254	0.744
Perception of self-efficacy_E6	0.917	0.046	19.782	0.741
Digital competency beliefs_D1	0.888	0.044	20.141	0.718
Goodness-of-fit indexes	Robust Chi Square = 446.144; df= 172 (p=0.000) Comparative Fit Index (CFI) = 0.789 Tucker-Lewis Index (TLI) = 0.742 RMSEA = 0.133 90 percent confidence interval RMSEA: [0.121, 0.145] p-value RMSEA <0.05 = 1.000 SRMR = 0.076			
Scale reliability (factor 1)	Cronbach Alpha = 0.886 Omega = 0.887 Average Variance Extracted (AVE) = 0.607			

Validation results – Students (method B)

Category	#	Item title	Statement teachers	PCA
Factor 1: Beliefs				
Beliefs	D1	Digital competency beliefs	I feel confident in using digital technology for teaching	.607
	D2	Perceived usefulness	I am convinced using digital technology improves teaching and learning in our school.	.729
	D3	Planning attitude	I believe it is meaningful to plan lessons involving digital technology in the classroom	.696
Continuing Professional Development	E4	Motivation self	I feel motivated to learn more about teaching with digital technologies	.782
	E6	Perception of self-efficacy	I take initiative myself to learn and develop the skills needed to teach with digital technologies	.673
	E7	Information seeking	I seek (new) information on how to teach with digital technologies	.632
Factor 2. Skills outside the classroom				
Factor 3. Conditions for digital learning				
Total variance explained (cumulative)				46.952

Validation results – Students (method B)

Table 3. Estimates using the WLSMV estimation method WLSMV students' scale; isolating beliefs scale

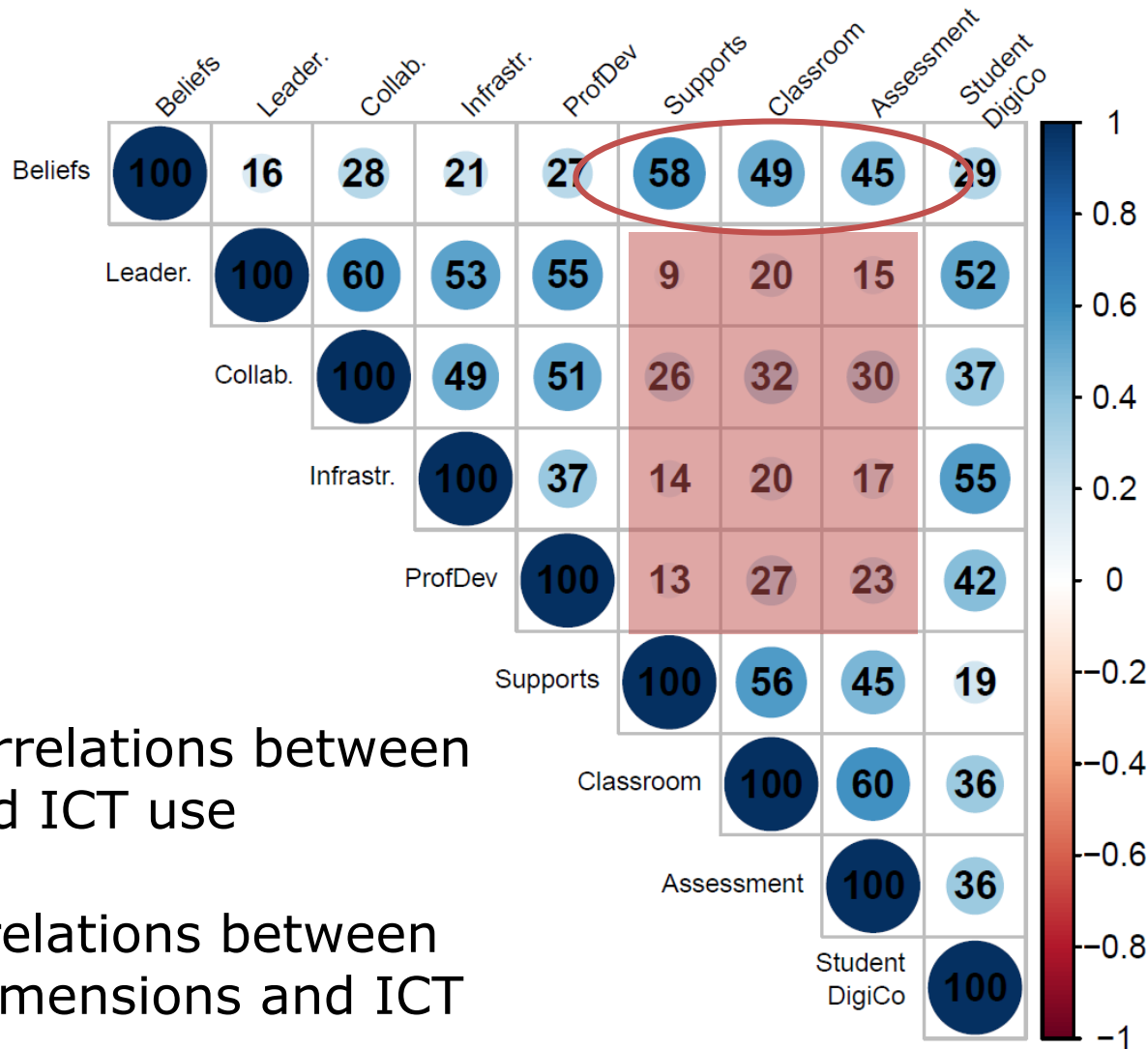
Items	Estimate	Std.Err.	t-value	Standardized solution
1. Motivation self_E4	1.000			0.705
2. Perceived usefulness_D2	1.153	0.033	35.188	0.813
3. Planning attitude_D3	1.089	0.034	31.638	0.768
4. Perception of self-efficacy_E6	0.952	0.034	27.854	0.672
5. Information seeking_E7	0.712	0.037	19.439	0.502
6. Digital competency beliefs_D1	1.022	0.035	29.254	0.721
Goodness-of-fit indexes	Robust Chi Square = 490.779; df= 70 (p=0.000) Comparative Fit Index (CFI) = 0.897 Tucker-Lewis Index (TLI) = 0.886 RMSEA = 0.087 90 percent confidence interval RMSEA: [0.080, 0.000] p-value RMSEA <0.05 = 0.956 SRMR = 0.062			
Scale reliability (factor 1)	Cronbach Alpha = 0.819 Omega = 0.800 Average Variance Extracted (AVE) = 0.495			

Construct comparison

	Teachers method A	Teachers method B	Students method B
D1	Digital competency beliefs	Digital competency beliefs	Digital competency beliefs
D2	Perceived usefulness	Perceived usefulness	Perceived usefulness
D3	Planning attitude	Planning attitude	Planning attitude
D7	Future intentions	Future intentions	
E4	Motivation self	Motivation self	Motivation self
E6	Perception of self-efficacy	Perception of self-efficacy	Perception of self-efficacy
E7	Information seeking	Information seeking	Information seeking

→ Construct identical for both methods and each group

Dimension correlations (Teachers)



- Strong correlations between beliefs and ICT use
- Weak correlations between context dimensions and ICT use

Conclusions

- Construct (after item elimination) is valid, reliable, and consistent
- Beliefs have strong influence on the ICT use
- Investing in teachers' ICT beliefs may yield greater enhancements of ICT integration than prioritizing contextual investments.



Recommendations

- Further explore the influence of ICT beliefs on ICT integration
- More data should be collected to confirm results with larger dataset
- Strongly consider ICT beliefs as part of digitalization process
 - Take away barriers
 - Emphasize benefits
 - Build confidence



Thank you for your attention

kérdések? spørsmål? klausimai?
Fragen? kysymyksiä?
pitánja? pytania? perguntas? vragen?
питання? suggetti?
otázky? Questions?
Ερωτήσεις? frågor? întrebări? pytania?
domande? въпроси?
küsimused? spurningar?



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