



**REFORM@WORK:**  
**SHIFTING TECHNOLOGY LEADERSHIP PRACTICES IN A CURRICULUM**  
**REFORM IN SWITZERLAND**

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## OVERVIEW OF TODAY'S PRESENTATION

1. Introduction
2. MIL Curriculum Reform in Switzerland
3. Theory: Information technology & distributed leadership
4. Drivers for ICT integration
5. The Study
  - Data & Methods
  - Results
6. Conclusion
7. Implications

# MIL MODULAR CURRICULUM

## Reform

- national curriculum in media and information literacy (MIL) (Arbeitsgruppe M&I, 2015)
  - national strategy for digitalization was published in 2018 (EDK, 2018)
  - weekly content of MIL for students in grades K to 6
  - stand-alone subject or taught integrated in different subjects in the curriculum
- rethinking of teacher education and training, the role of key actors in schools – such as ICT coordinators as well as the role of school leader

# MIL MODULAR CURRICULUM

## *Media literacy and usage*

- Digital communication
- Operate tools and devices
- Use of media for learning; searching the internet
- Gather, produce and present information
- Cyber security and data protection



## MIL MODULAR CURRICULUM



### ***Automation and information processing***

- Analogue – digital
- Encoding, programming
  - Experimenting
- Experience data storage and retention
- Understand search engines

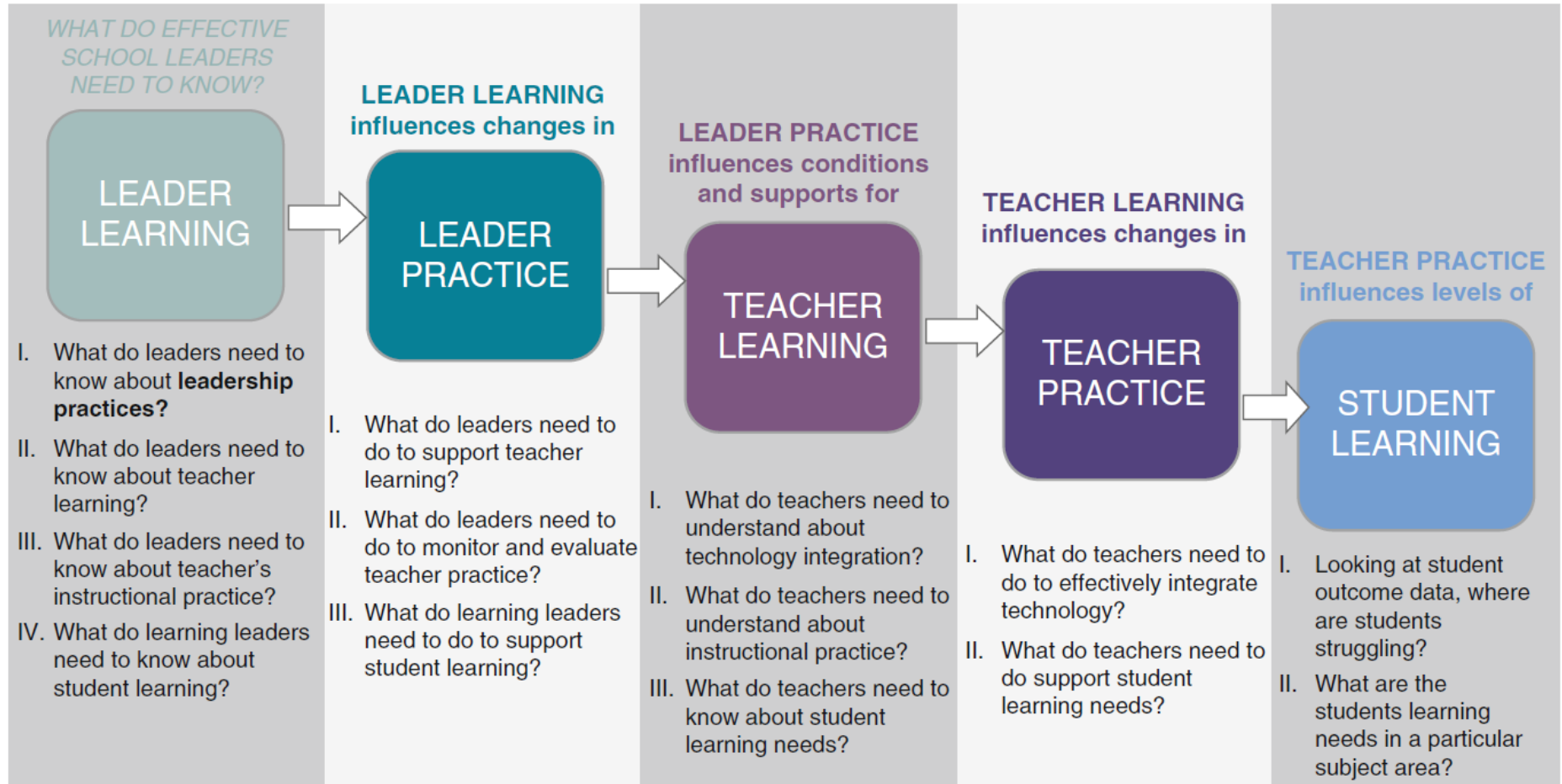
## RESEARCH QUESTIONS

### Research Questions

We have collected data 26 schools in six cantons - each with its own MIL policy framework - following these research questions:

- Who takes over specific information technology (IT) leadership practices in schools?
- Do these leadership practices overlap between school leaders and ICT coordinators concerning the three key factors?
- Are there patterns of the distribution of these practices?

# THEORY: LEADERSHIP



Theory of action for technology leadership (Dexter, 2018)

## THEORY

### **What do we mean by «information technology leadership»?**

“Information technology (IT) leadership requires that school leaders understand both how IT specifically serves as a means to an instructional end and how to create the conditions that foster such uses.” (Dexter, 2018)

It also entails to...

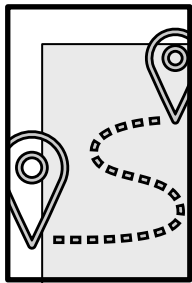
- have a vision for organisational change through IT
- support teachers who are already at the forefront of using technology as facilitators
- foster exchange and collaboration

(Marell-Olsson & Bergström, 2018)

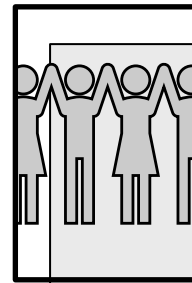


## THEORY: TECHNOLOGY LEADERSHIP

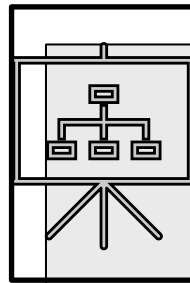
### Practices for successful technology leadership



Setting directions.



Developing people.



Developing the organization.

(own representation based on Leithwood, Harris & Hopkins (2008), Leithwood (2012); Louis et al. (2010))

## DRIVERS OF ICT-INTEGRATION IN SCHOOLS

**Distributed Leadership** is the appropriate leadership model to foster technological innovation in schools

- Divide tasks and IT knowledge between a **team of people**
- Those also take over a part of the **responsibility** in the three key functions of leadership practices
- Faster implementation with **transformational leadership**
- School leaders need **TLACK: technological leadership content knowledge** to be able to take over their role for ICT integration in schools

(Dexter 2007; Halverson 2018; Tulowitzki & Gerrick 2020; Ruloff & Petko, 2021)

## DRIVERS OF ICT-INTEGRATION IN SCHOOLS

ICT Coordinators play an important role for introducing and supporting the use of digital tools in schools

(Avidov-Ungar & Shamir-Inbal, 2013; Hammond, 2014, McGarr, 2013)

### ICT Coordinator's tasks:

- Policy-making
- Walking-around
- Nuts-and-bolts (Marcovitz, 2000)
- Planner
- Educationalist
- Technician (Devolder et al. 2010)

➤ Varying job descriptions may lead to conflicts and inefficiency

(Vallance, 2006; Devolder et al., 2010; Woo & Law, 2020; León-Jariego et al., 2020)

## THE STUDY

### Design

- 25 school leaders / 26 ICT Coordinators
- Scale: originally 43 items, translated from Dexter (2018), reduced to 31 items and 3 scales: *Are you/have you been involved in the following task in your school?*
- Scaling of answers: yes/no (dichotomous)

### Method / Analysis

- Frequency analysis & distributions between SL and ICTC
- TwoStep Cluster Analysis
  - Exploratory tool, analyses the natural grouping of a dataset
  - Variables may be continuous or categorical
  - Cluster criterion is the Bayesian Information Criterion (BIC)
  - Possible to create a cluster membership variable

## RESULTS

### RQ1: Distribution of IT- leadership practices

#### Setting directions:

- Number of Items: 9; SL: N=25,  $\alpha = .687$ ; ICTC: N=26;  $\alpha = .677$

#### Developing people:

- Number of Items: 11; SL: N=24,  $\alpha = .623$ ; ICTC: N=25;  $\alpha = .703$

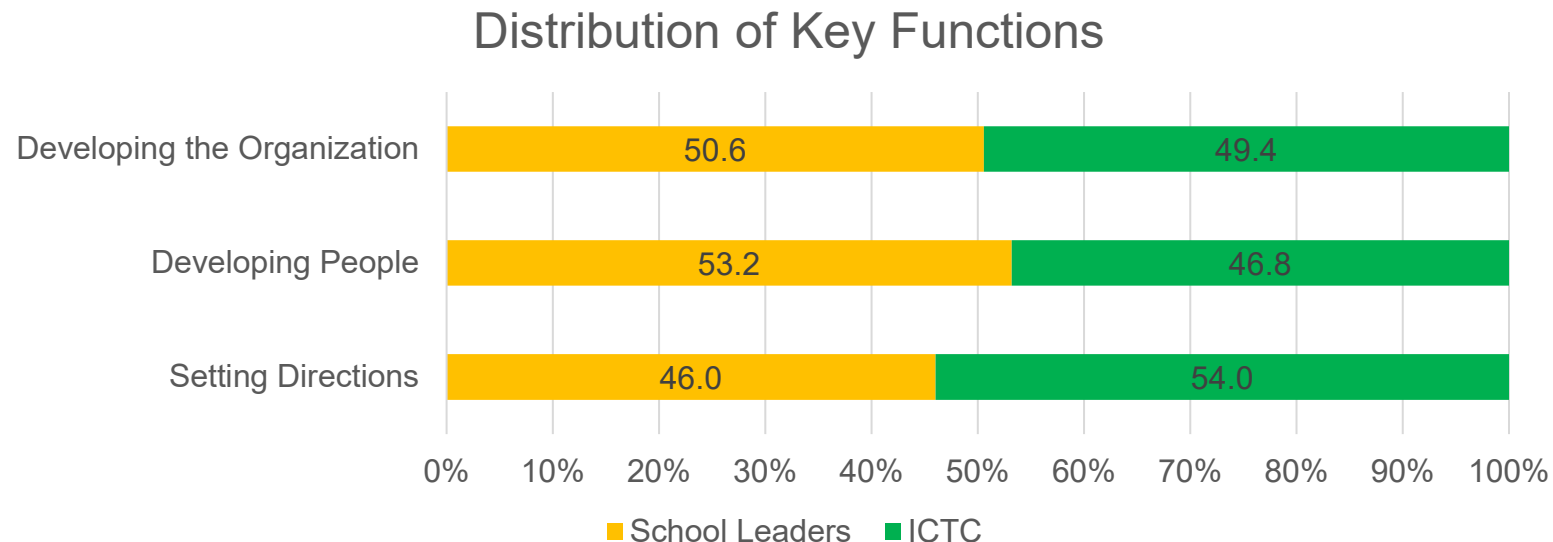
#### Developing the organization:

- Number of Items: 11; SL: N=24,  $\alpha = .747$ ; ICTC: N=25;  $\alpha = .715$

# RESULTS

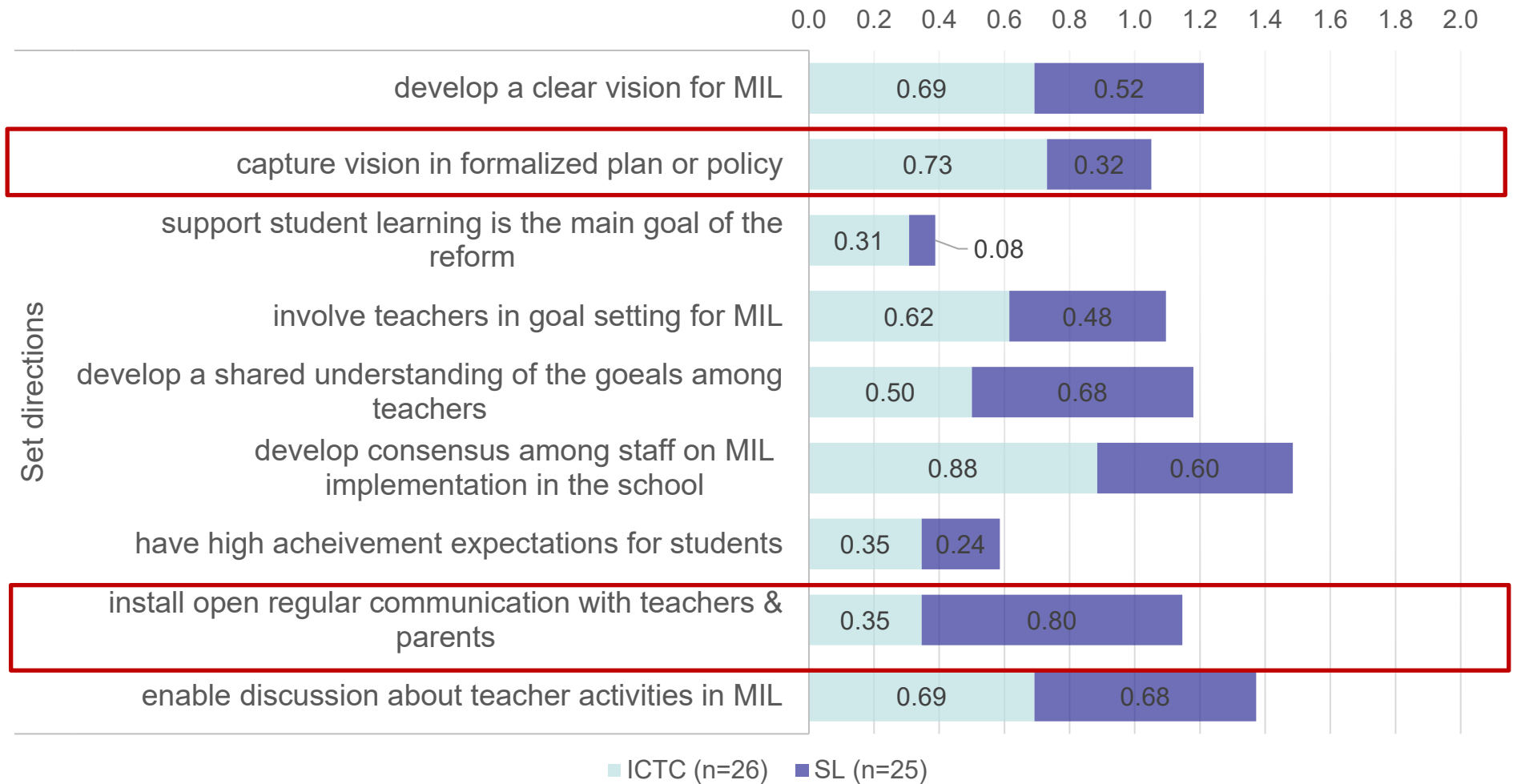
## RQ1: Distribution of IT- leadership practices

Looking only at the key functions, school leaders and ICT coordinators see their responsibility about equally distributed:



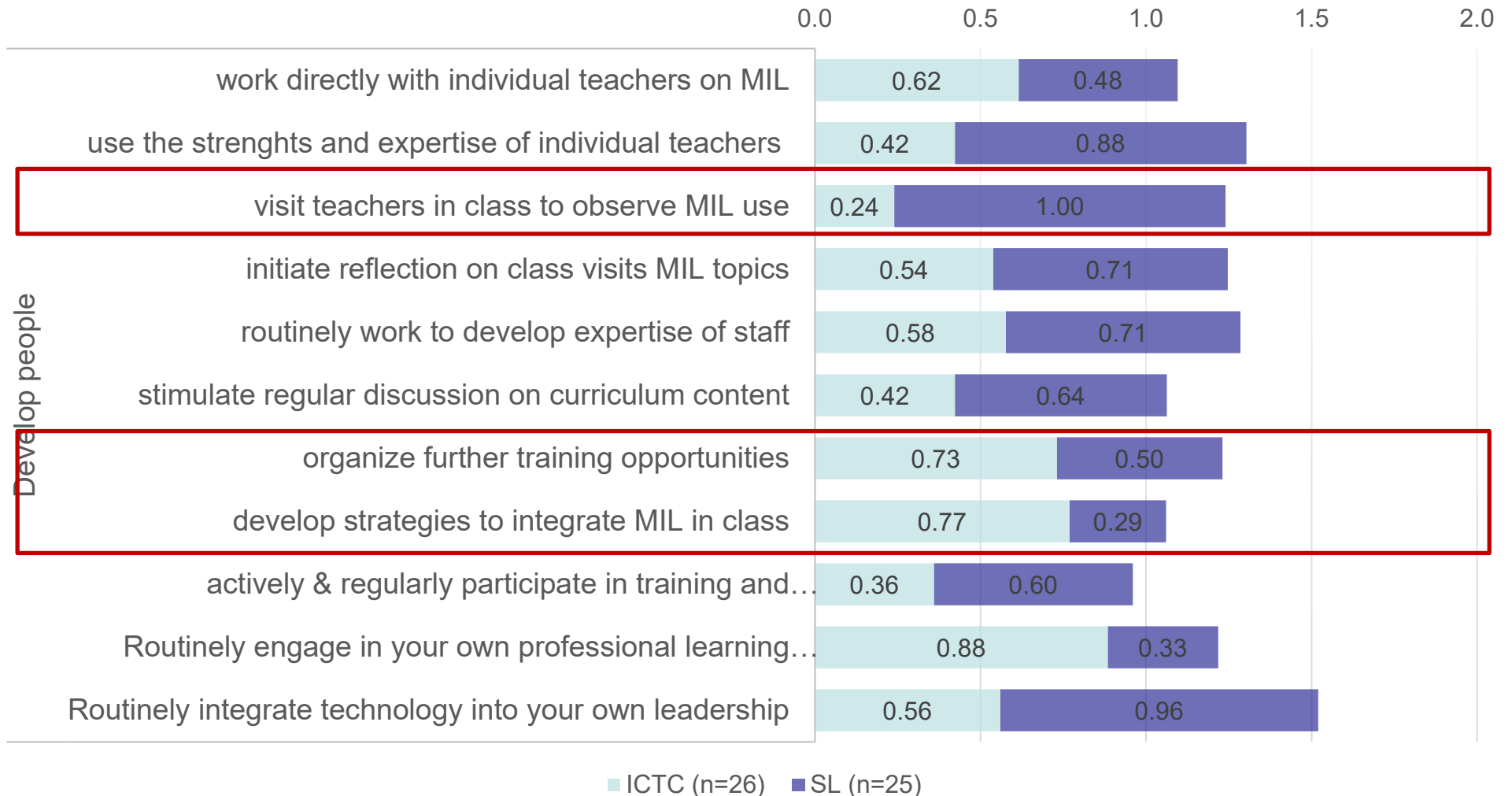
# RESULTS

## RQ2: Overlap between practices of SL and ICTC:



# RESULTS

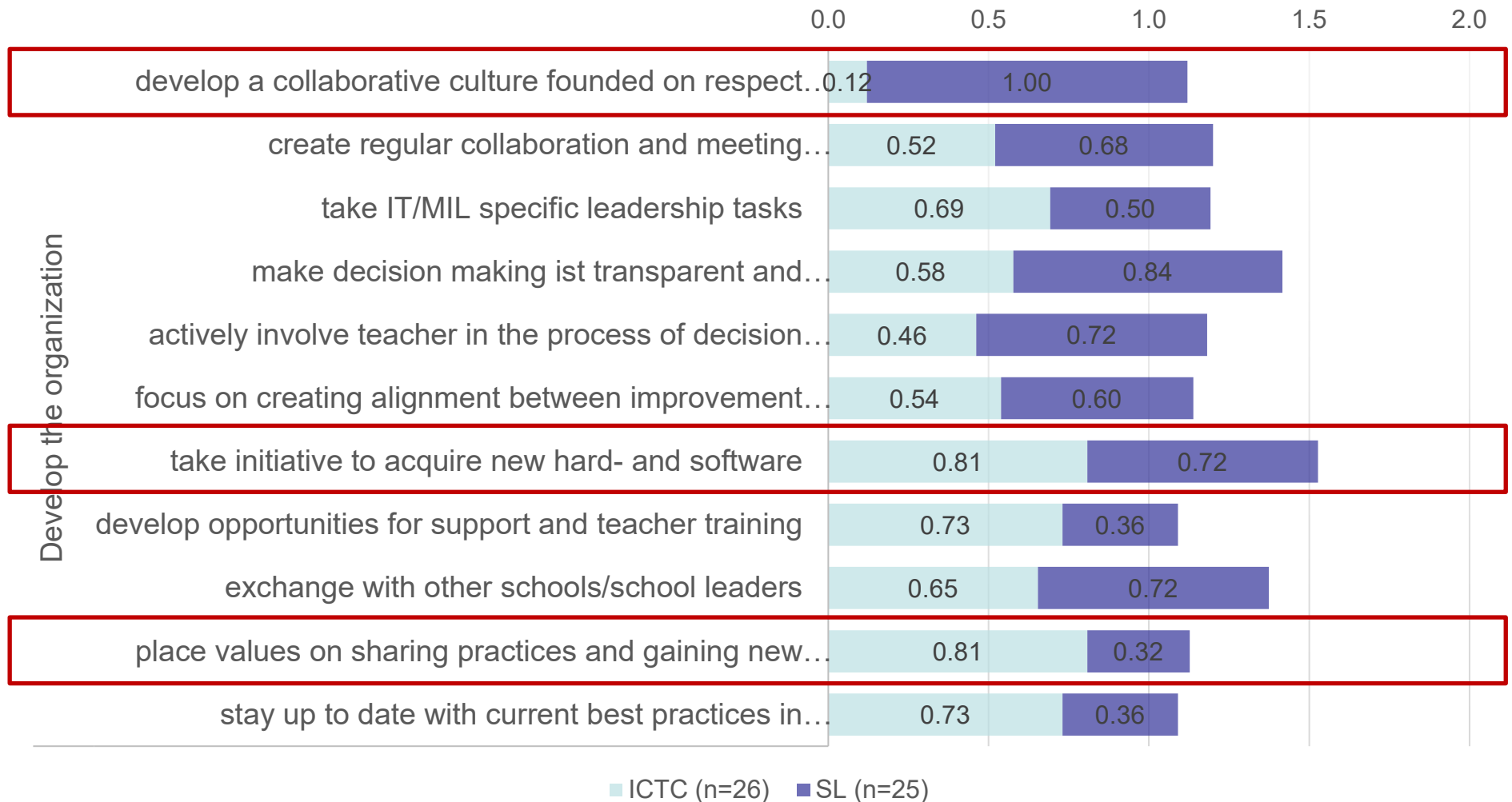
## RQ2: Overlap between practices of SL and ICTC:





# RESULTS

## RQ2: Overlap between practices of SL and ICTC:



# RESULTS

## RQ3: patterns of the distribution of these practices

### Model Summary

<b>Algorithm</b>	TwoStep
<b>Inputs</b>	31
<b>Clusters</b>	3

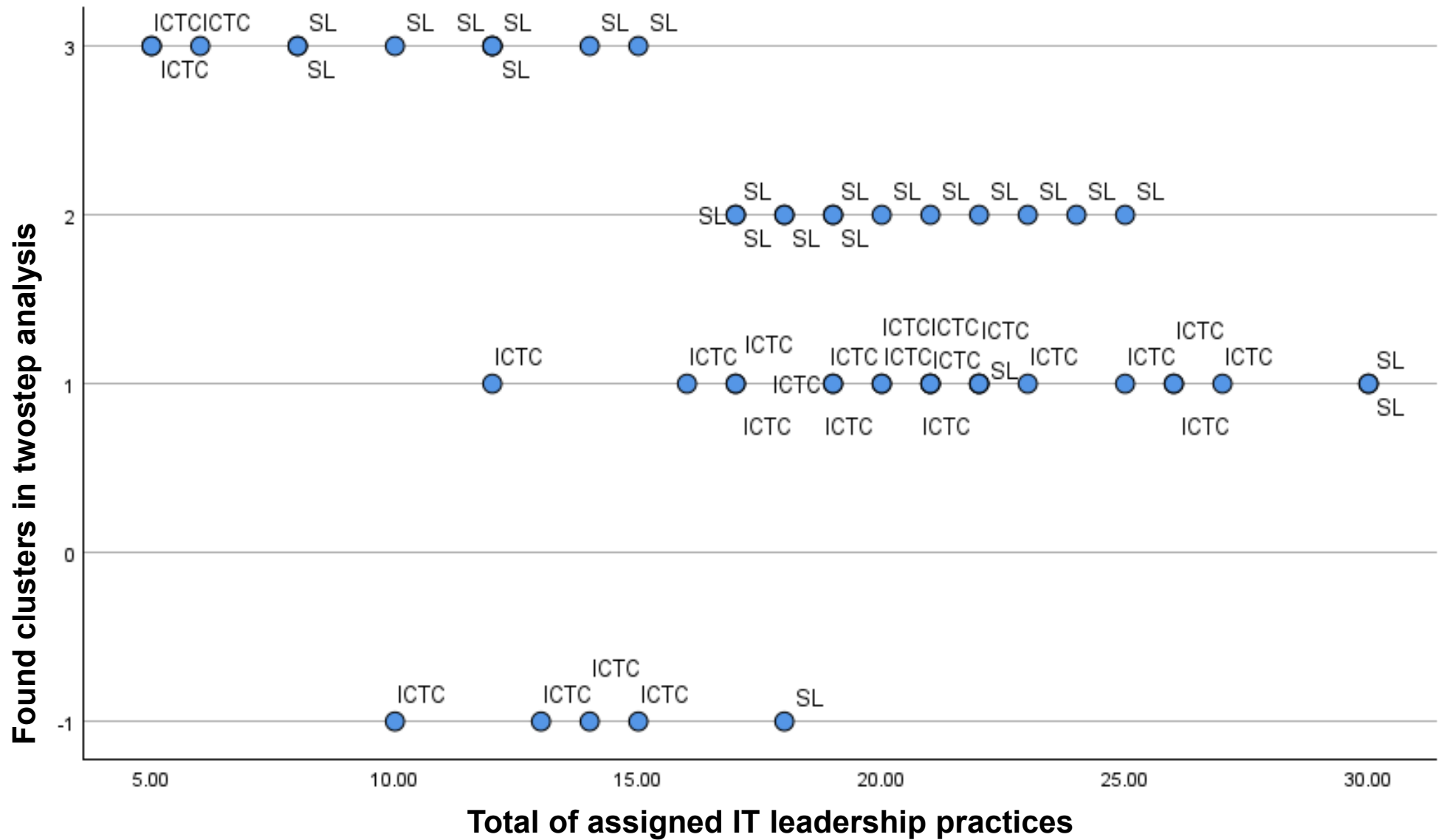
### Cluster Distribution

	N	% of Combined	% of Total
Cluster 1	16	32.7%	30.8%
Cluster 2	20	40.8%	38.5%
Cluster 3	10	20.4%	19.2%
Outlier (-1)	3	6.1%	5.8%
Combined	49	100.0%	94.2%
Excluded Cases	3		5.8%
Total	52		100.0%

### Cluster Quality



# RESULTS



## DISCUSSION

### **Cluster 1: “the dedicated IT leaders”**

ICTC taking over parts of the IT leadership practices and two SL who are taking most of the leadership practices > SL with both roles?

### **Cluster 2: “the formal IT leaders”**

Only SL who take a considerable share of leadership practices but all leave some tasks to others (ICTC...)

### **Cluster 3: “the reluctant IT leaders”**

Mixed cluster of ICTC and SL, taking only a small share of practices themselves. Maybe either ICTC with IT practices or less IT prone SL?

**Outliercluster:** hard to define... any suggestions?

## CONCLUSION

- Leadership practices are distributed between SL and ICTC
  - SL are mainly responsible for:
    - Culture in the school and common values
    - Assessment of the employed teachers
    - Personnel responsibilities
  - ICTC are mainly responsible for:
    - Task that entail technological content knowledge
    - Knowledge transfer in the teacher team
    - Formalize plan / vision
- 
- ICTC are the drivers of the implementation of MIL in the classroom
  - Unclear, whether the lack of technological content knowledge of SL impedes their leadership function
  - ICTC steps in to guarantee MIL implementation

## IMPLICATIONS

### Research

- Further develop scale > adapt scaling to reaching a higher scale level
  - Item on student learning and assessment: country specific?
- Indepth qualitative research
  - on their understanding of leadership / IT implementation
  - on other roles > which actors step in if neither the SL nor the ICTC takes the lead
  - Other skilled/trained teachers, school board etc.?

### Practice:

- Differentiate between the role of the SL and ICTC > clarify job descriptions and maybe adapt roles and consider salary? Is the position of the ICTC just a «additional task» for teachers?
- Clarify the need for TLACK in training for SL and ICTC
- School concept might help to divide tasks and practices

## Questions?



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SCHWEIZERISCHER NATIONALFONDS  
FONDO NAZIONALE SVIZZERO  
SWISS NATIONAL SCIENCE FOUNDATION

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