Presentation Plan

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Digital4Education
2015

"Through apprenticeship programs & innovative educational projects that bring digital technology to youth, the strategy will inspire future ICT experts & entrepreneurs"

- **equal opportunities for innovation**: introduction of makerspaces within schools
- **hubs for the future**: three schools serve as training centers with dedicated secondary ICT programs (programming, big data management, fintech & video game development).
- **a new sphere in education**: online teaching & learning platform, enables teachers to deliver modern, multimedia-based lessons

einfach digital
2020

Computational Thinking in Fundamental Schools

Computer / Digital Science courses in Secondary Schools

Context: educational challenges

BRIDGING THE DIGITAL DIVIDE
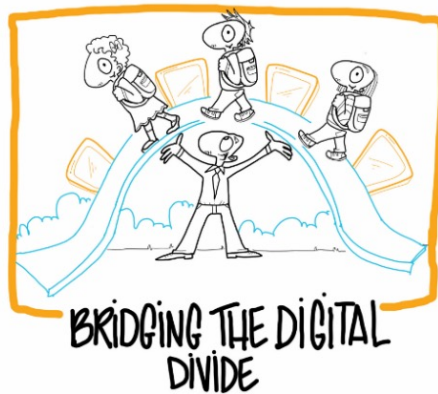
- Give **all students** an **equal access** to ICT tools
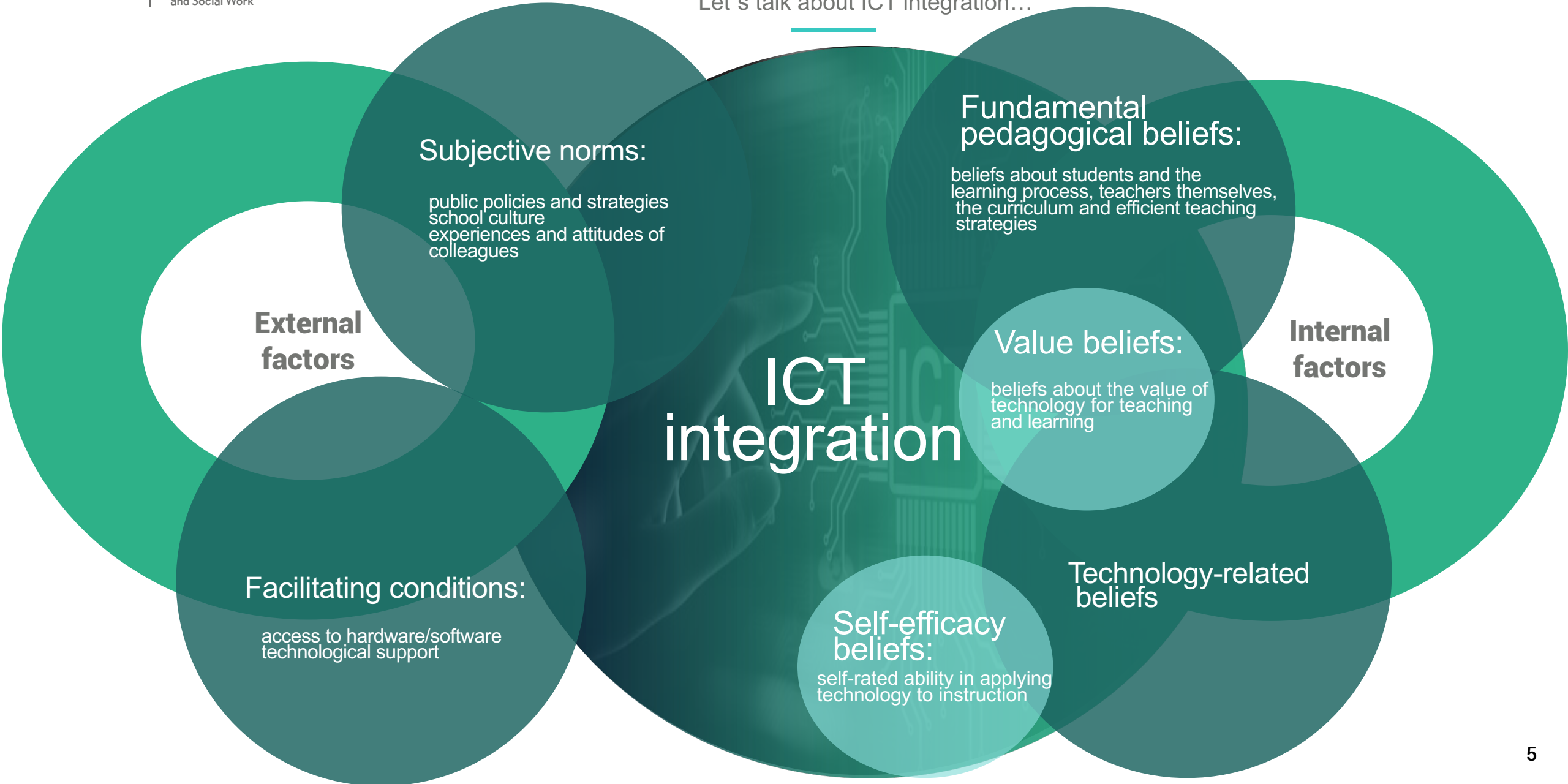- Use the potential of ICT to address the **different needs** of students

PREPARING FOR TOMORROWS JOBS

- **Promote** the use of **ICT** in education (formal & non-formal)
- Integrate **ICT-related skills** into the **curriculum**
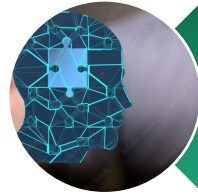

DIGITAL LËTZEBUERG

- Contribute to a **national effort**
- **Adapt** the education system to the demands of the labor market

Theoretical foundations

Let`s talk about ICT integration…

External factors

Internal factors

Subjective norms:

public policies and strategies
school culture
experiences and attitudes of colleagues

Fundamental pedagogical beliefs:

beliefs about students and the learning process, teachers themselves, the curriculum and efficient teaching strategies

Value beliefs:

beliefs about the value of technology for teaching and learning

ICT integration

Facilitating conditions:

access to hardware/software
technological support

Self-efficacy beliefs:

self-rated ability in applying technology to instruction

Technology-related beliefs

Research Goals

better understand value beliefs of Luxembourgish fundamental school teachers

investigate and document which factors influence teacher value beliefs in Luxembourg
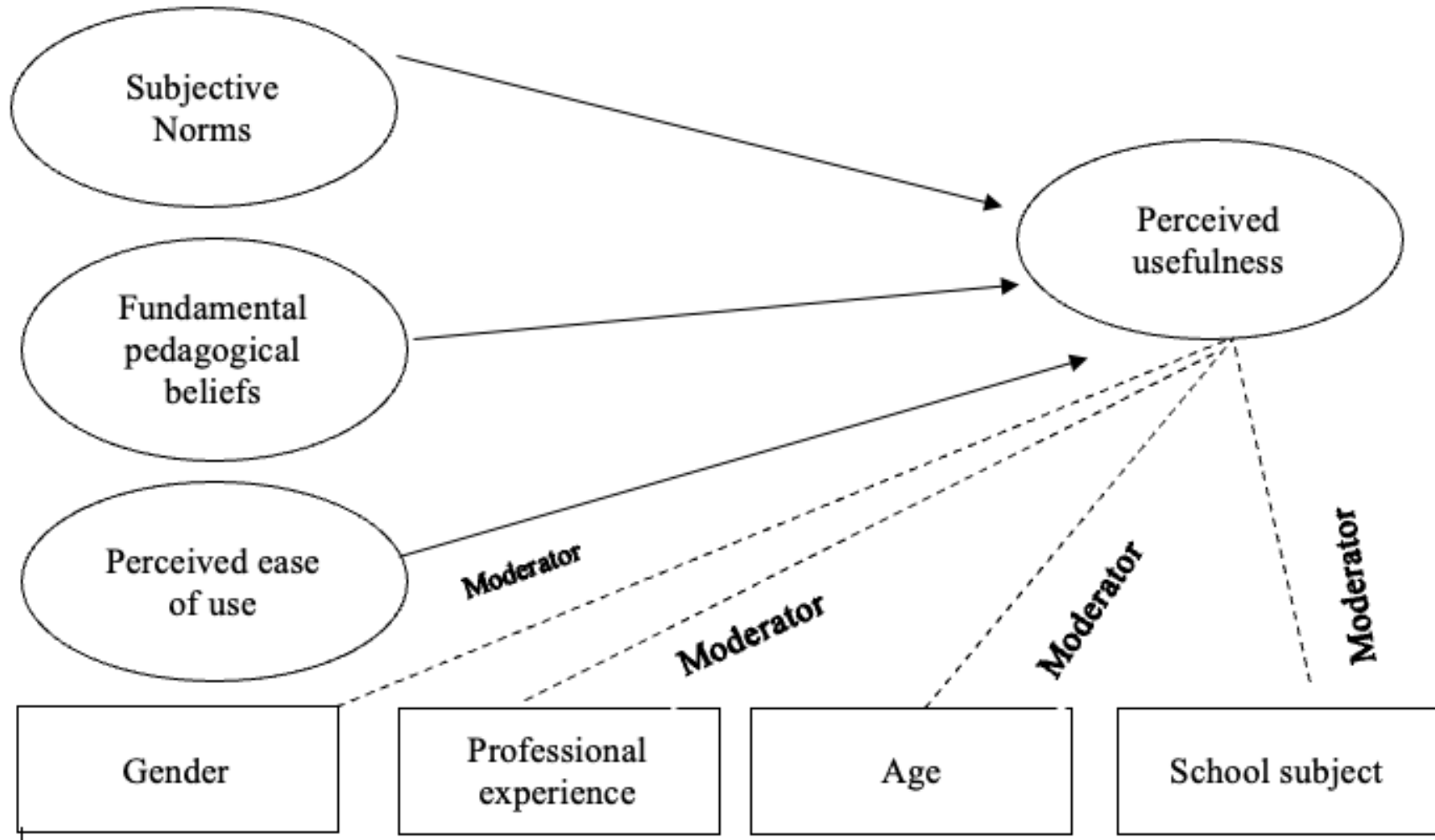
inform decision-makers responsible for initial and continuous teacher training on research findings

ensure the further development and implementation of efficient technology integration policies and strategies

Research method

Research model and hypotheses

Research method

Research model and hypotheses

H1: **age, gender, professional experience and a school subject** are **moderators of value beliefs** expressed through perceived usefulness (PU) (originally developed by the authors of the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003).

H2: **subjective norms** predict **perceived usefulness of ICT**;

H3: **fundamental pedagogical beliefs** predict **perceived usefulness of ICT**

H4: **perceived ease of use** predicts **perceived usefulness of ICT** (presented in the TAM model developed by Davis 1989)

Research method

Research instrument

- **Online survey** using the LimeSurvey platform hosted by the University of Luxembourg

- No data that could directly identify participants collected

- **Scales** used:

  - totally agree, rather agree than disagree, neither agree nor disagree, rather disagree than agree, totally disagree

  - never, at least-once a year, at least once a month, at least once a week, at least once a day

  - one choice questions.

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Research method

Research instrument

The survey included **29 items** divided into **5 categories**

| Demographic information	Fundamental pedagogical beliefs	Subjective norms	Perceived ease of use (self-efficacy beliefs)	Perceived usefulness (value beliefs)
• gender • age • professional experience (in years) • function • grades • region of employment	• 3 items, **2 different classrooms** (teacher centered and student centered) • which kind of class discussion was more more comfortable for teachers, from which type of classroom students gained more knowledge and skills • two one-choice questions on **main goals of a teacher and principles of instruction**	• 9 items, 2 subcategories: • **internal school culture** (micro-contextual factors): school culture and attitudes towards technology, exchanges and support from the school management and colleagues • **public policies** (macro-contextual factors): nation-wide trends and policies, their coherence, efficiency, and potential benefits	• 6 items • teacher perceptions regarding their technology proficiency, abilities to cope with obstacles, and efficiency of policies in terms of technology accessibility and ease of use	• 11 items, 2 subcategories: • teacher perceptions regarding **value of technology for their professional activities** and performance (speed, productivity) • **value of technology for teaching and learning in general** (new instructional strategies, personal treatment of students, distractions etc.)

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Research method

Data analysis

- To ensure the internal consistency of the survey, **Cronbach's alpha test** was conducted.

- The demographic information was summarised through **descriptive statistics**.

- For the rest of study constructs, **mean "category" and "subcategory"** (perceived usefulness, subjective norms) **scores** of each respondent were calculated. Through **correlation and regression analyses** the study hypotheses were tested.
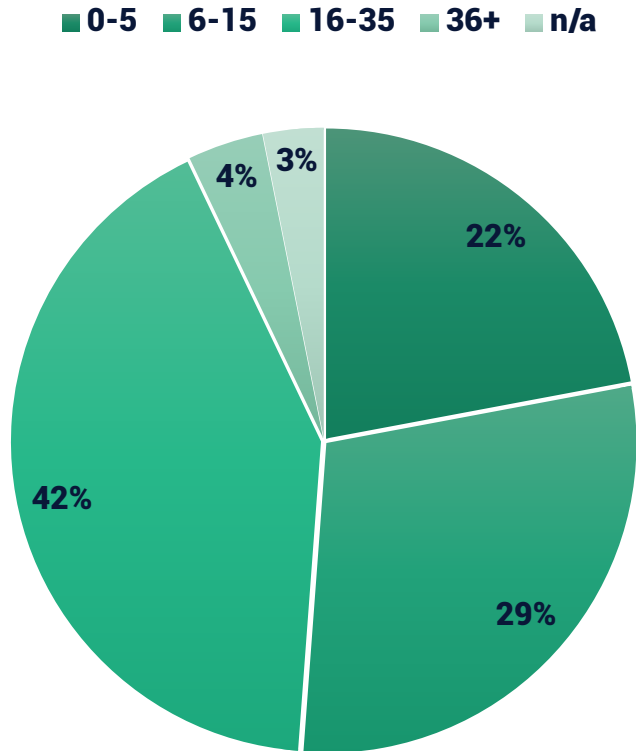
Results and Discussion

Demographics
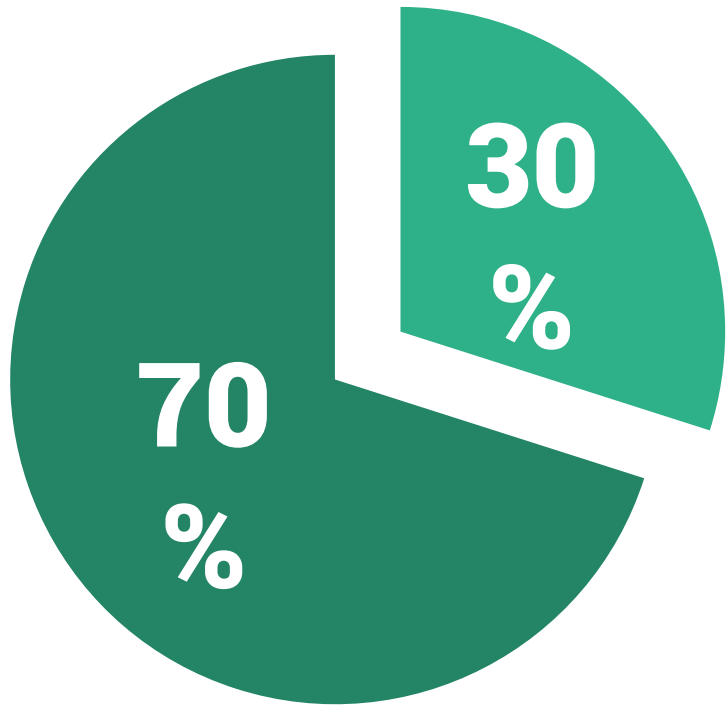
The participants were recruited through **convenient and snowball sampling techniqu**es. The study sample included **127 representatives** of all the categories of teaching personnel of Luxembourgish fundamental schools .
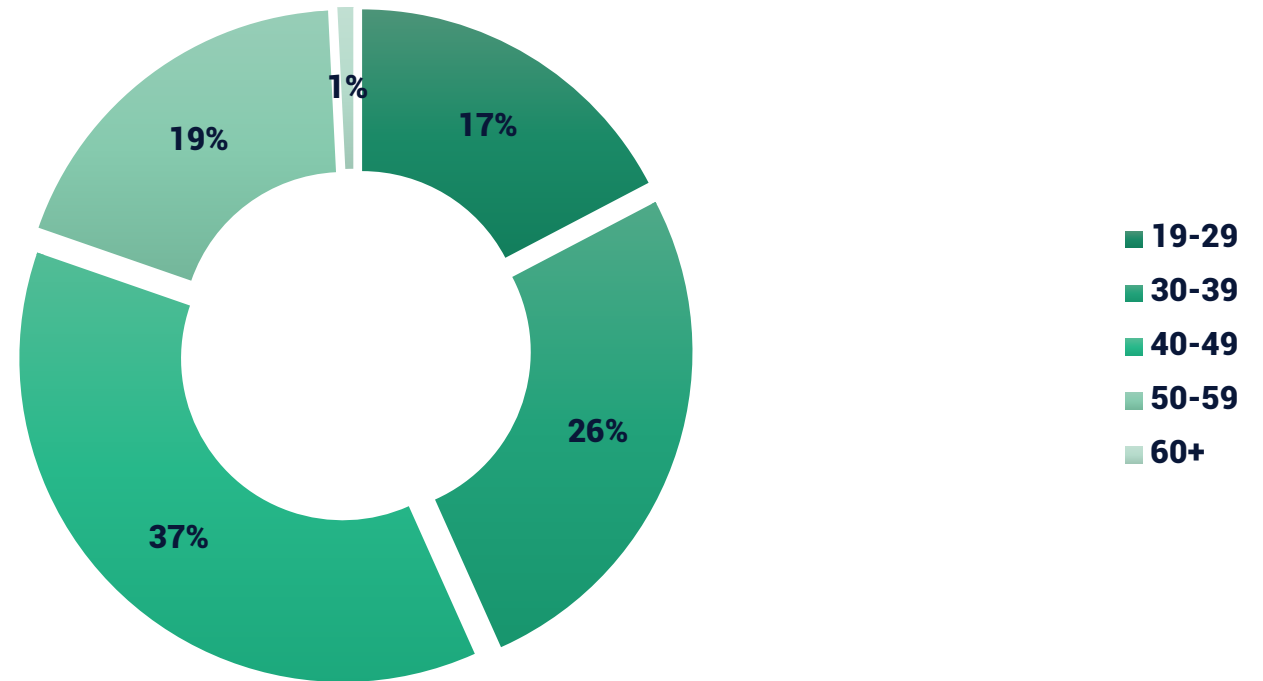
30%

70%

Results and Discussion

Demographics

Experience

■ 0-5 ■ 6-15 ■ 16-35 ■ 36+ ■ n/a

Age

■ 19-29
■ 30-39
■ 40-49
■ 50-59
■ 60+

The mean age range of teachers was between **30-39** (33 participants, 26%) and **40-49** (47 participants, 37%) years old. Levels of experience varied among teachers with 42% having **16-35 years of experience**, and 29% having **6-15 years of professional experience.**
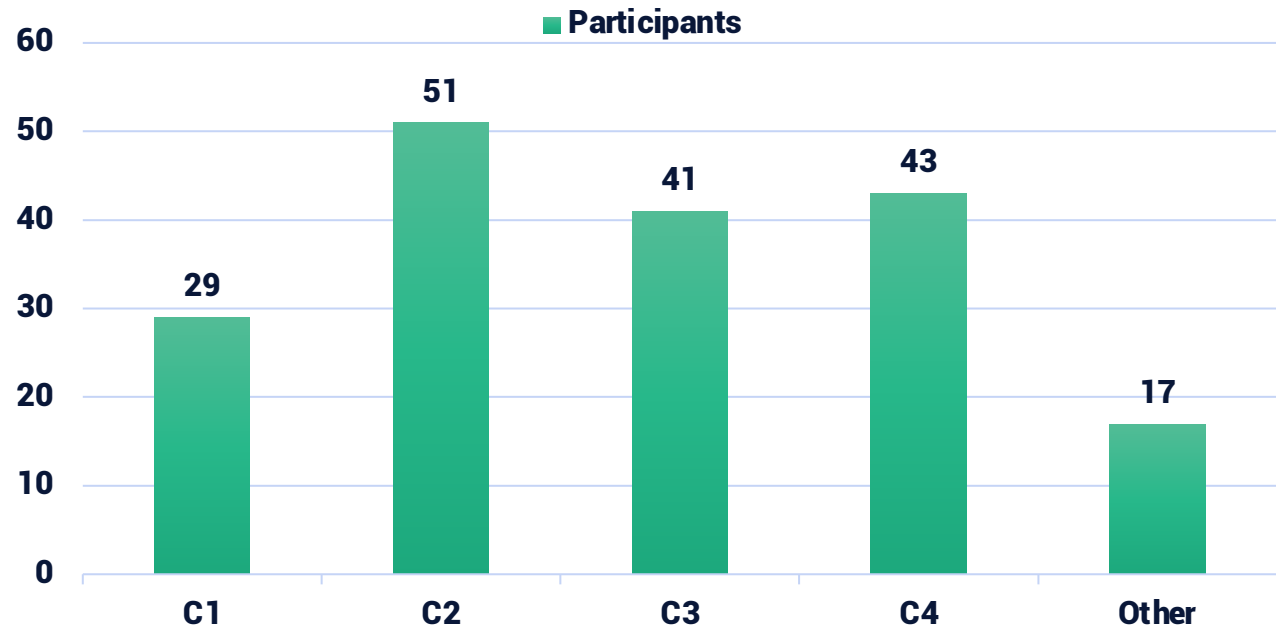
Results and Discussion

Demographics

Function

- Instituteur
- Chargé(e)
- Éducateurs/-trice
- Éducateurs/-trice gradué(e)
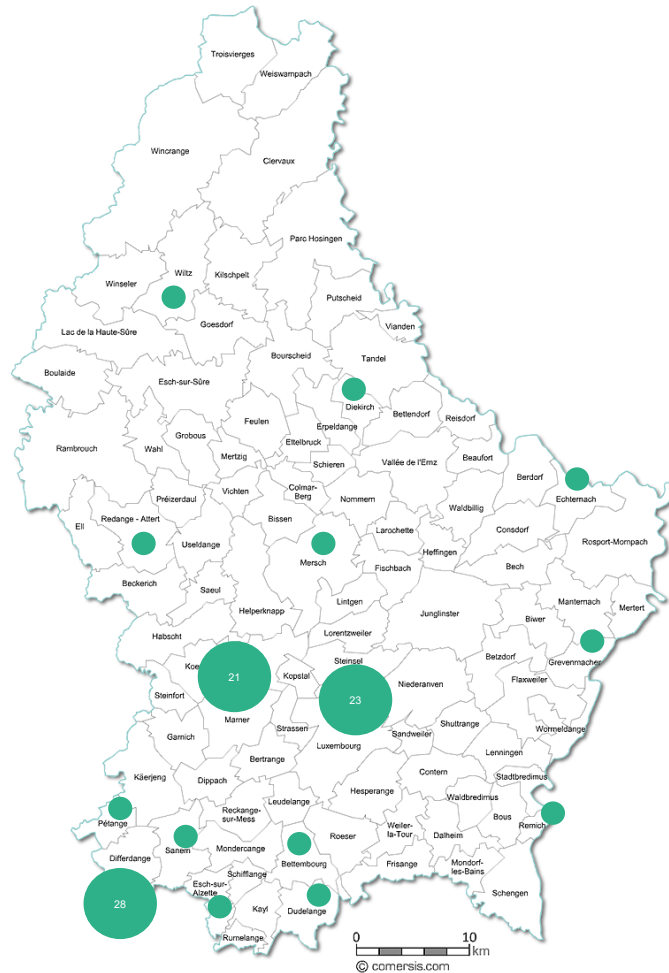- Stagiaire
- Remplaçant(e)
- n/a
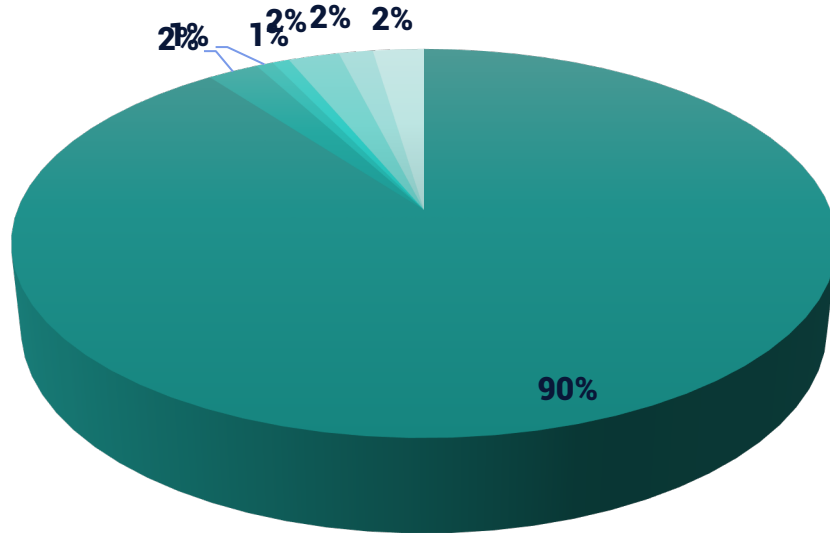
Cycles

- Participants

The majority of participants worked as **Instituteurs** (114 respondents, 89,7%) in **C2** (51 respondents) or **C4** (43 respondents) classes.

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Results and Discussion

Demographics

The most popular working locations of study participants were **Differdange** (28 respondents, 22,05%), **Luxembourg** (23 respondents, 18,11%), and **Mamer** (21 respondents, 16,54%).
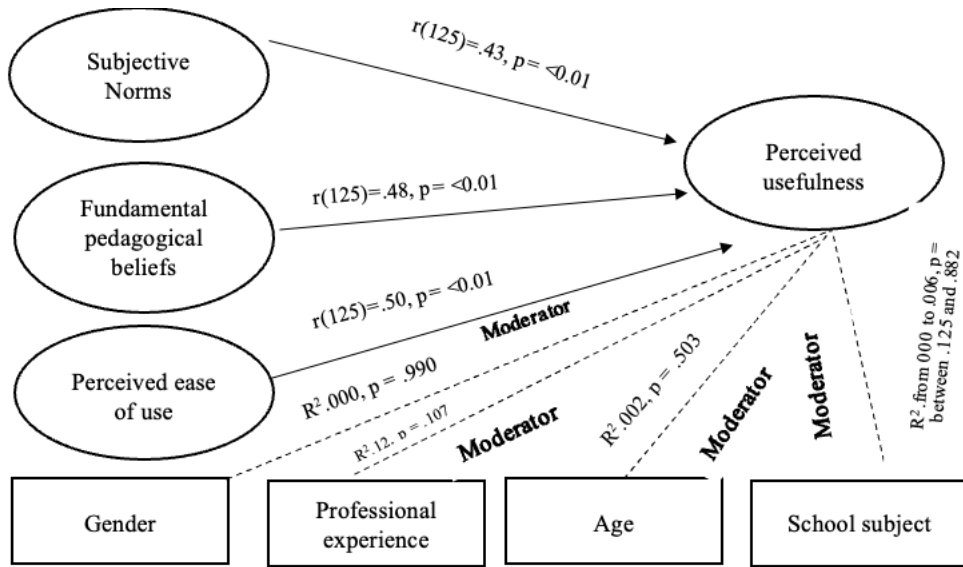
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expressed through perceived usefulness (PU)
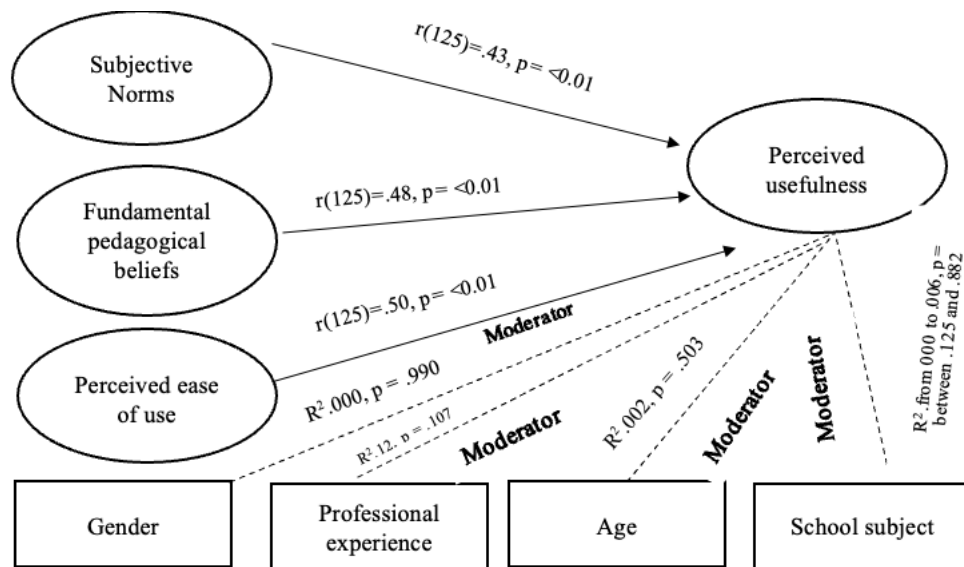
NOT SUPPORTED

AGE AND EXPERIENCE

PREVIOUS STUDIES
both age and experience moderate key relationships in the model (dependent variable – behavioral intention).
→ Younger teachers use technologies more often and by themselves, and older and more experienced ones often need some help with computers and software.

REASONS FOR OPPOSITE FINDINGS

- **a new generation of young teachers** raised in the digital era might have appeared, and the older generation might have learned how to deal with technology;
- **the dependent variable was changed** from behavioral intention or actual usage to perceived usefulness

GENDER AND SUBJECT

H1: **age, gender, professional experience** and a **school subject** are moderators of value beliefs expressed through perceived usefulness (PU)

NOT SUPPORTED

PREVIOUS RESEARCH

GENDER
- "gender differences in the use of information technology may be transitory" (Venkatesh et al. 2003, p. 469)
- No gender differences in TPACK scores discovered, meaning that "gender gap may be closing" (Raper 2018, p. 38).

SUBJECT
- Technologies are used more frequently in language, mathematics classes.

OUR FINDINGS

Gender could not be considered as a moderator of value beliefs:
- the appearance of a new, digital-age generation
- the elimination of gender inequalities and stereotypes

Languages (German) and mathematics have gained the most attention for technology integration. However, the **differences between school subjects are insignificant** to consider them as a moderator of value beliefs:
- the boom of applications and digital activities which enable the integration of technologies into the curriculum of any school subject.
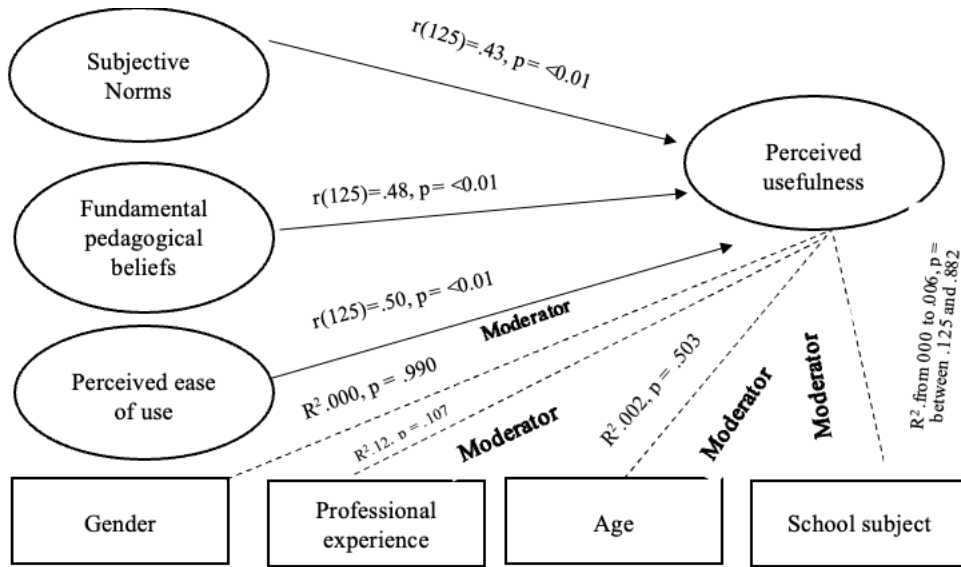
H2: **subjective norms** predict **perceived usefulness of ICT**
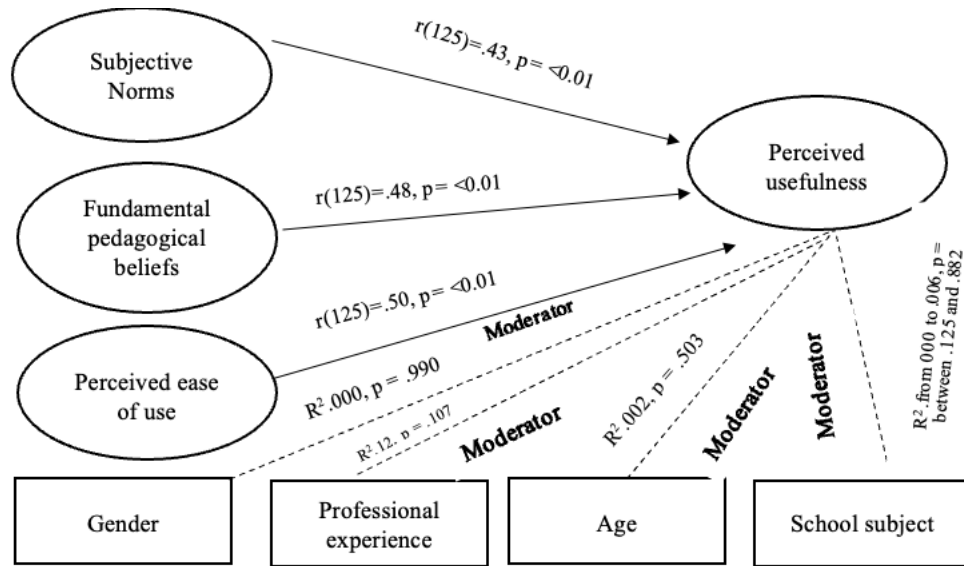
SUPPORTED

SUBJECTIVE NORMS

PREVIOUS STUDIES

Contradictory findings: some studies show that subjective norms have a significant influence on perceived usefulness, but some of them fail to find these connections

OUR STUDY

- ✓ direct moderate relationship between the environment and value beliefs found;
- ✓ the political component consisting of recent public policies, strategies, and other initiatives has a more significant impact than long-term collegial interaction and collaborative support
  → strong public leadership and aligned vision on community goals are more empowering than practices of other teachers.

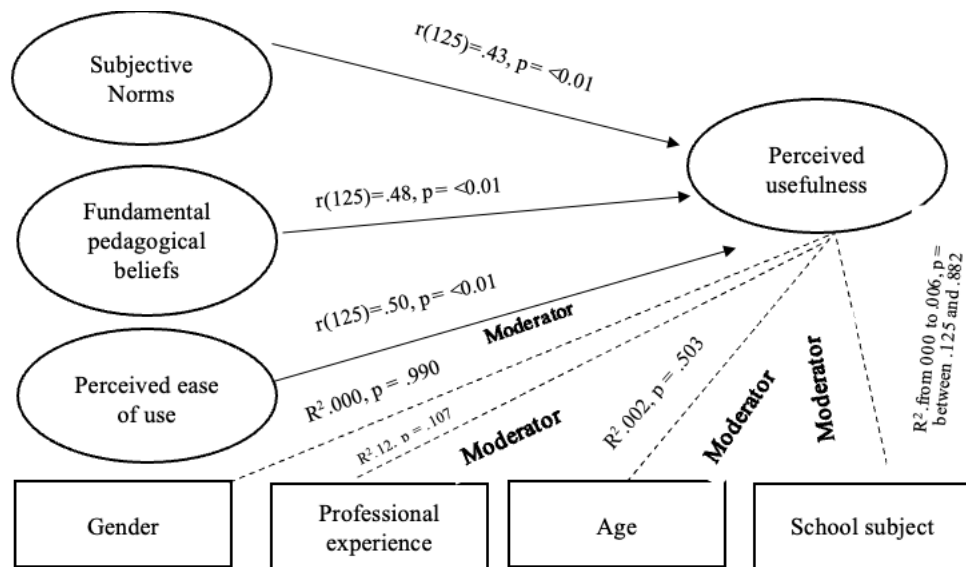**H3: fundamental pedagogical beliefs** predict **perceived usefulness of ICT**

SUPPORTED

FUNDAMENTAL PEDAGOGICAL BELIEFS

PREVIOUS STUDIES:

o technology-using teachers are more constructivist than non-using ones;
o the pedagogical approach has either limited (Drent et al. 2008, p. 193) or significant (constructivist – positive, teacher-centered – negative) impact on innovative use of ICT (Hermans et al. 2008, p. 1506).

OUR STUDY:
✓ a direct relationship between fundamental pedagogical beliefs and value beliefs, exists
✓ teachers with the constructivist approach are more likely to find technologies useful and to use them in their practices.

H4: **perceived ease of use** predicts
perceived usefulness of ICT

SUPPORTED

PERCEIVED EASE OF USE
PREVIOUS STUDIES AND OUR FINDINGS:

o perceived ease of use is one of the most important factors predicting perceived usefulness

IMPLICATIONS:
✓ when teachers feel competent to integrate technology, they are more likely to feel that using technology in classrooms is interesting, important, useful.

Conclusions

(1) Results show that **value beliefs**, i.e., beliefs about the value of technology for teaching and learning **are impacted by a set of factors**, including (a) **pedagogical approach and fundamental pedagogical beliefs**, (b) public policies and internal culture of the school (components of **subjective norms**), and (c) **perceived ease of use** (the most important factor).

(2) The boom of technologies, digital devices, and applications, the appearance of a new, digital-age generation and the elimination of gender inequalities and stereotypes have resulted in the **insignificance of gender, age, experience, and subject for teachers` perception of the value of technology** in education.

(3) In terms of subejctive norms, **strong public leadership and aligned vision** on community goals are more empowering than practices of other teachers. In this context, strong public leadership and aligned vision require **coherent and transparent public policies**, **decisions and actions, close collaborations and consultations between public officials and teachers**, including dissemination of information on community goals and public expectations. Nonetheless, the potential benefits of **teacher discussions and interactions** are not to be neglected; they should be addressed using all available means at both school and governmental levels.

(4) We believe that **professional development**, as an integral part of the "policy component", and a "traditional" instrument to boost digital competencies and self-efficacy beliefs of teachers, is **one of the most efficient ways to promote positive teacher value beliefs** and innovative technology-based pedagogical practices.

Efficient technology integration is achieved through advanced teacher training on technology integration, (a) providing teachers with **sufficient technological support and coaching** during and shortly after professional development, with **enough time to experiment;** (b) enabling teachers to **experience advantages of technology** for education, to **discuss, collaborate and reflect**.

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Stay Connected with Us

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