SDT-Based Thematic Coding of Trainer Observations

Coding Framework

The trainer notes were coded deductively using Self-Determination Theory (SDT), structured around the three basic psychological needs:

Autonomy (A)

- **A1:** Initiative and choice
- **A2:** Reduced fear of errors
- **A3:** Perceived relevance

Competence (C)

- **C1:** Initial low self-efficacy
- **C2:** Skill acquisition
- **C3:** Confidence gains

Relatedness (R)

- **R1:** Peer support
- **R2:** Shared emotional experience
- **R3:** Collaborative problem solving

INFINITY SDT-Based Coding

AUTONOMY

A1: Initiative and Choice

- *"As sessions progressed, participants increasingly volunteered answers rather than waiting to be prompted."*
- *"Some participants began reading question cards aloud voluntarily."*
- *"Informal game-role allocation (e.g., participants started calling each other "Best Googler", "Luckiest Cyber-Hand") reflected playful ownership of participation."*

A2: Reduced Fear of Errors

- *"Initial hesitation ("I might not know the answer"; "I haven't used a smartphone much") gradually diminished once gameplay began."*
- *"The tactile, turn-based format reduced anxiety by making participation feel familiar rather than evaluative."*
- *"Mistakes were met with humor and laughter rather than embarrassment."*
- *"Participants reported that it 'felt more like playing than being tested.'"*

A3: Perceived Relevance

- *"Participants connected phishing cards to real-life bank email experiences."*
- *"Real-world examples triggered personal recognition ("I received something like this last week")."*
- *"Tasks were perceived as directly applicable to everyday digital challenges."*

COMPETENCE

C1: Initial Low Self-Efficacy

- *"Several participants stated they were 'too old for digital things.'"*
- *"Some expected to fail before beginning."*
- *"Early rounds revealed visible uncertainty and dependency."*

C2: Skill Acquisition

- *"Participants demonstrated improved understanding of QR codes after peer explanation."*
- *"Repeated exposure to scenarios increased familiarity with digital terminology."*
- *"Participants began explaining rules and answers to others after initially struggling."*

C3: Confidence Gains

- *"Shift from hesitant participant to helper within the same session."*
- *"More and more comments such as: 'Now I actually know some things' and 'This wasn't as hard as I thought'"*
- *"Observable posture changes (more upright, active engagement)."*
- *"Participants took more initiative in subsequent rounds."*

RELATEDNESS

R1: Peer Support

- *"Participants leaned toward one another to clarify answers."*
- *"Teammates gently coached struggling participants."*
- *"Encouragement was spontaneous and supportive."*

R2: Shared Emotional Experience

- *"Collective laughter during mistakes or penalty squares."*
- *"Humor transformed errors into bonding moments."*
- *"'Fake awards' strengthened group cohesion."*

R3: Collaborative Problem Solving

- *"Frequent discussion before locking in answers."*
- *"Group reasoning aloud strengthened collective understanding."*
- *"Participants validated each other's responses."*

DiGiUP SDT-Based Coding

AUTONOMY

A1: Initiative and Choice

- *"Participants increasingly insisted: 'Let me try first.'"*
- *"More independent task attempts compared to INFINITY."*
- *"Participants delayed asking for help to test their own ability."*
- *"Emergence of self-directed problem-solving behaviors."*

A2: Reduced Fear of Errors

- *"Participants described the environment as a 'sandbox, not a test.'"*
- *"Visible reduction in anxiety compared to traditional instruction."*
- *"Errors triggered laughter rather than withdrawal."*
- *"Participants reported feeling 'less nervous' about mistakes."*

A3: Perceived Relevance

- *"Narrative-driven virtual house scenario increased personal identification."*
- *"Participants described tasks as 'practical' and 'like our own home.'"*
- *"Recognition of phishing attempts in real-life after gameplay."*

COMPETENCE

C1: Initial Low Self-Efficacy

- *"Some participants initially deferred to others."*
- *"Hesitation before attempting complex digital scenarios."*

C2: Skill Acquisition

- *"Improved speed in identifying suspicious messages."*
- *"Reduced need for trainer prompts over time."*
- *"Application of learned strategies to new but related tasks."*

C3: Confidence Gains

- *"Statements such as 'I didn't know I could do this.'"*
- *"Expression of pride after independently solving tasks."*

- *“Recollection and application of learning outside the session (“That happened last time and I remembered what we did here.”)”*
- *“Observable empowerment and increased digital self-efficacy.”*

RELATEDNESS

R1: Peer Support

- *“Participants consulted one another before confirming answers.”*
- *“Informal mentoring roles emerged naturally.”*
- *“Increased encouragement across rounds*.”

R2: Shared Emotional Experience

- *“Collective surprise at successful task completion.”*
- *“Shared excitement when solving complex problems.”*
- *“Group validation of individual achievements.”*

R3: Collaborative Problem Solving

- *“Strategic division of roles (email specialist, browsing specialist, safety checker).”*
- *“Structured consultation before decision-making.”*
- *“Development of group-based reasoning strategies.”*
- *“Increased trust and coordination within tables.”*