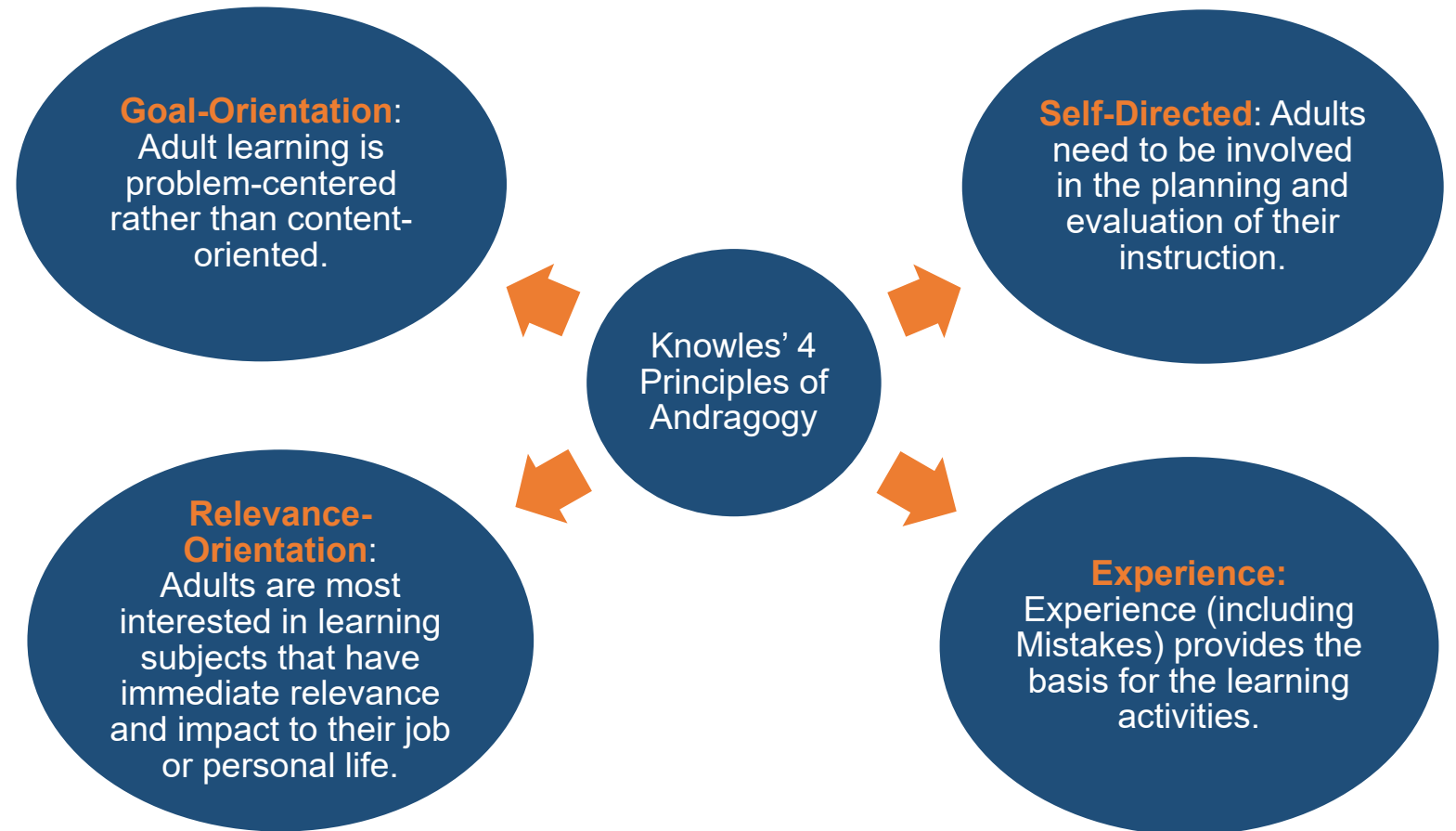- Pre-COVID
    - Belief of in-person instructor-led training was far superior to virtual or online learning.

- Online learning experiences considered substandard.
    - Fallback option for workplace learning.

- Paradigm shifted almost overnight.
    - Need for social distancing forced widespread migration to virtualized teaching and instruction for all learners.

Adult Learning Theories

The common characteristics of adult learners as understood within the profession (Merriam & Bierema, 2014; Abdullah et al., 2008).

Goal-Orientation: Adult learning is problem-centered rather than content-oriented.

Self-Directed: Adults need to be involved in the planning and evaluation of their instruction.

Knowles' 4 Principles of Andragogy

Relevance-Orientation: Adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life.

Experience: Experience (including Mistakes) provides the basis for the learning activities.

Conversion to the Online Classroom

The need for alignment to core andragogical theories in the online classroom is not a new concept.

- Learning results must align with teaching modality (Davis & Arend, 2013).

- Content originally designed for in-person classroom should be adjusted to activities/program to align with learner needs (Fein & Logan, 2003).

- Instructors facilitate an environment where learners experience self-direction, construct meaning, and create meaningful discussion (Davis & Arend, 2013; Fein & Logan, 2003).

- Realism of the learning environment is key to success, learners benefit from the content being more project- and activity-based (Fein & Logan, 2003).

Andragogical Principles in Online Classrooms

In online learning instructor involvement is equally important and relevant when aligned with deep content (Arghode et al., 2017).

- Facilitators need to orchestrate online activities and provide immediate feedback (Arghode et al., as cited in Yamagata-Lynch et al., 2015).

- Students are likely to favor individual work in an online setting (Arghode et al., 2017; Deineha et al., 2020)

- Adult learning theory in the virtual classroom requires curating and customization for the online environment

Purpose of Quantitative Study

Why?

- Investigate the inclusion of foundational adult learning theories and practices in the virtual classroom for technicians of a large telecommunications operator.

- Analyze whether use of these methods in remote learning experience proves just as effective as in-person learning.

To do so, we pose the following questions:

- Does the perceived effectiveness of virtual training change based on the use of adult learning principles/methods by the trainer?

- Do trainers who have received additional training themselves on adult learning in the virtual space receive better scores from participant on level 1 evaluations?

Participants

Employees within the field operations business unit of a large telecommunications operator.

- Drew from existing data set related to learner reactions that is already captured in the Learning Management System (LMS).

- Representative sample drawn from employees who completed any courses, both ILT and VILT, between July 1st 2019 and July 1st 2021.

- The nonprobability sampling method was used to select one geographic region to consider as part of this study.

Data Collection

- The concept of levels of evaluation for learning experiences, created by Kirkpatrick (1959, 1976, 1996).

- Kirkpatrick's model is comprised of four levels.
  - Reaction (level 1), learning (level 2), behavior (level 3), and results (level 4).

- For purposes of this research, we are considering the level 1 evaluations for the selected group of learners.

Data Collection

- Evaluations includes combination of question types.
  - Traditional and modified Likert scale, Yes/No, multiple choice, and open-ended responses.

- Open-ended responses are not considered.

- Question across the three evaluations ranged from the topic of pace to topics of applicability.

- One evaluation included questions that were specific to the performance of the instructor and answered using a traditional Likert scale.

Data Analysis

- Individual respondent data not included in data set, to preserve anonymity.
    - Trainers assigned a number (e.g. Trainer 1)
    - Open-ended text responses not considered within the scope of the study.

Scoring

- Likert Scale responses coded as numeric values (5 - Strongly agree, 4 – Agree, 3 - Neither agree nor disagree, 2 – Disagree, 1 - Strongly disagree).

- Yes/No responses coded as Yes=2 and No=1.

- Modified Likert scale was used for multiple choice questions with four possible answers, where 4 represents the positive response and 1 represents the negative response.

- All numeric values converted to percentages to enable mathematically accurate comparison

Data Analysis – Group Designations

- Data arranged into four discrete groups representing the time frame of pre- and post-pandemic.

- Groups representing those trainers who received additional training themselves on incorporating adult learning theories and practices into the virtual classroom, and those who did not.

Group	Description	Start Date	End Date
1	Pre-COVID ILT	July 1, 2019	March 1, 2020
2	VILT, Prior to additional training being offered	March 1, 2020	May 1, 2020
3	VILT, Trainers who received additional training	May 1, 2020	October 1, 2020
4	VILT, Trainers who did not receive additional training	May 1, 2020	October 1, 2020

Data Analysis

- Collected data using three different level 1 evaluations during the time period considered.

- To combine the data sets all individual questions were reviewed and assigned to categories and subcategories.

- Subcategorization aligns with foundational adult learning principles.

Categories	Subcategories
Adult Learning Theories & Practices	Instructor Overall Satisfaction
Adult Learning Theories & Practices	Classroom Management
Adult Learning Theories & Practices	Learning Objectives
Adult Learning Theories & Practices	Instructor Communication
Adult Learning Theories & Practices	Instructor Knowledge
Adult Learning Theories & Practices	Learning Pace
Learner Needs	Content Related to Job
Learner Needs	Learning Pace
Learner Needs	Overall Satisfaction/Recommendation
Learner Needs	Instructor Interaction
Learner Needs	Instructor Overall Satisfaction
Learner Needs	Learning Objectives
Learning Technology	Learning Technology
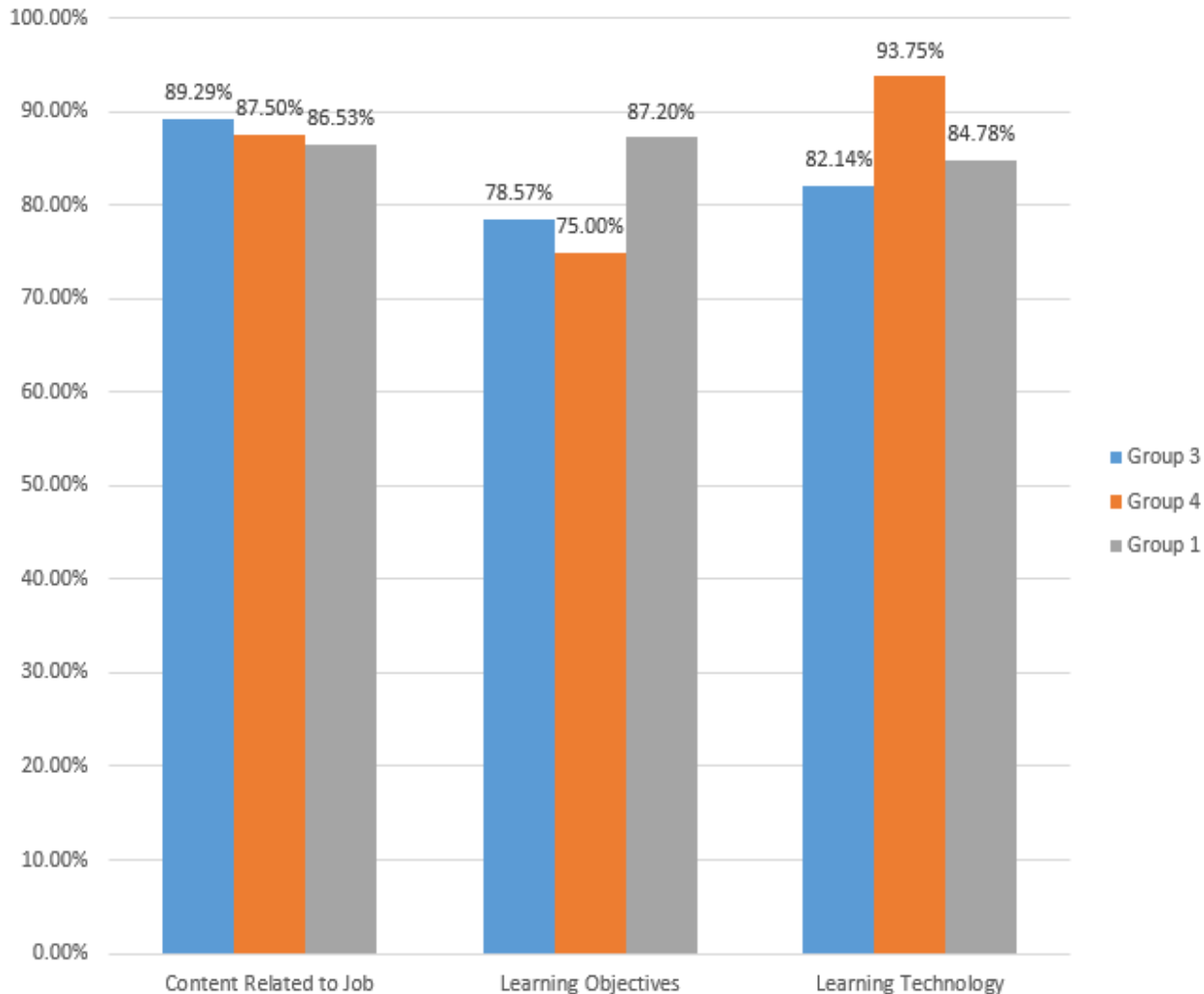
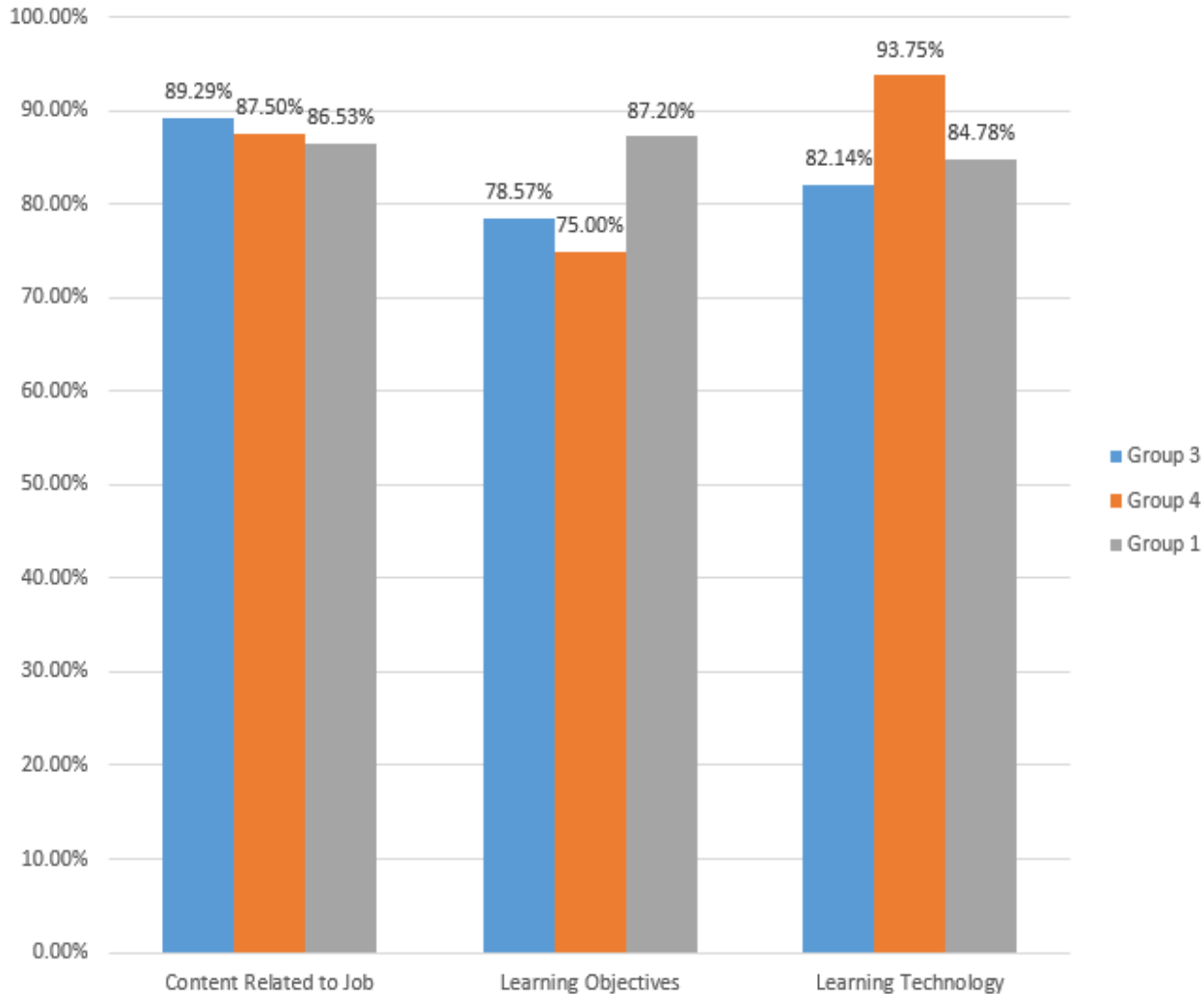# Results

Learning Objectives

- Mean evaluation scores for ILT compared to VILT were higher in the subcategory of Learning Objectives.
  - May indicate that instructors are more accustomed to clearly identifying learning objectives in ILT vs VILT.
  - May indicate that learners were better able to identify objectives when presented with hands-on learning.

- Group 4 were lower than peers during VILT.
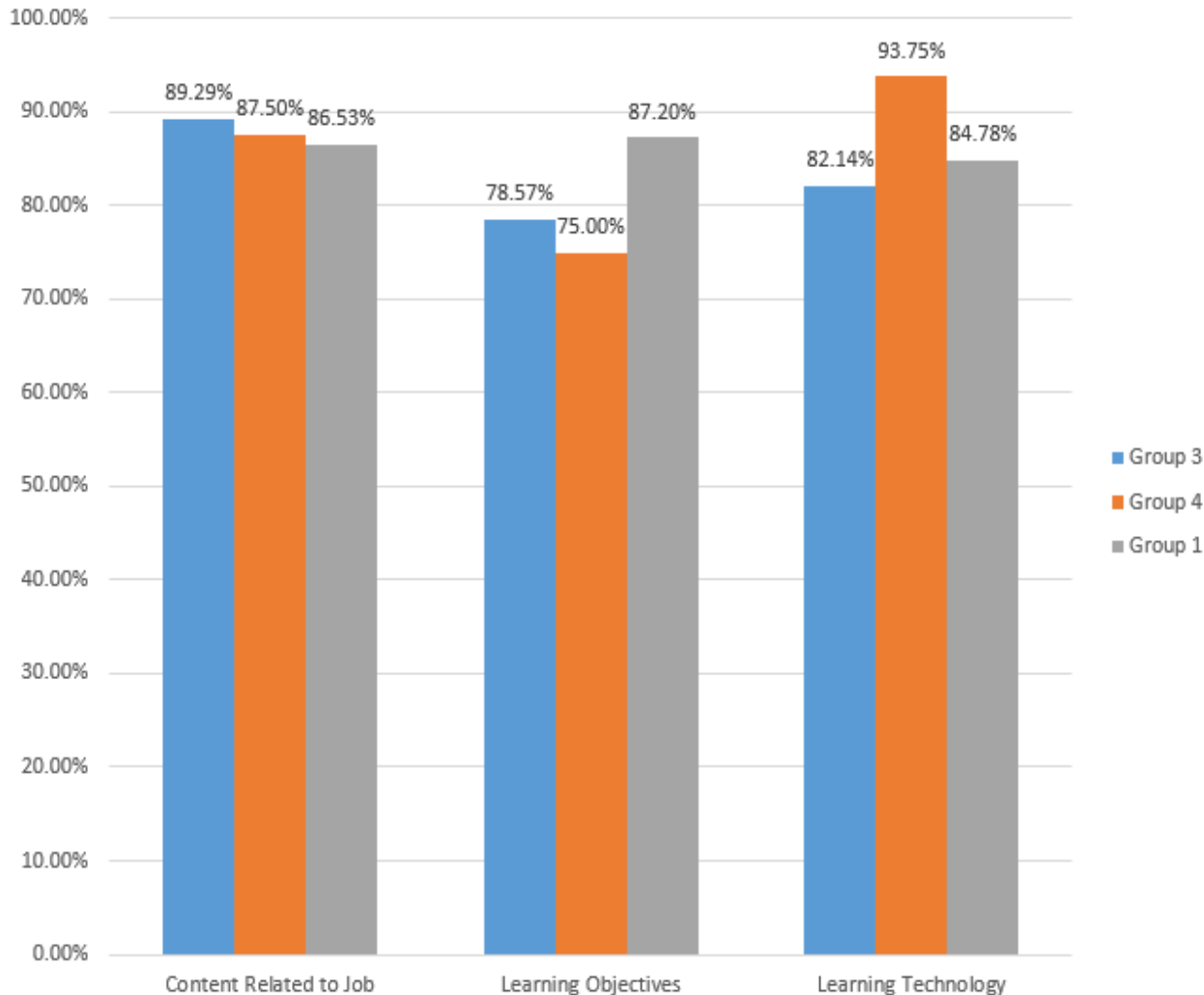
Results

Content Relevance to Job

- Group 3 marginally higher.
    - Instructors who use techniques to engage learners and construct meaning can foster an environment where learners can identify relevance to work.

- Group 3 VILT scored higher than even ILT group.
    - Additional developmental training for instructors on adult learning theories had overall positive effect, regardless of classroom environment.

Results

Learning Technology

- ILT courses scored higher overall than VILT; likely related to labs/hands-on tech rather than online teaching tool.

- Unexpected result that Group 4 scored significantly higher than Group 3 on VILT.
  - Likely Group 3 trainers used virtual tools (breakouts, polling) and learner scores may indicate this was a distraction.
  - Group 4 may have relied more heavily on traditional instructional techniques rather than tools.

Study Limitations

- **Sample:** Level 1 evaluations are not required; results may favor either those with strong positive or those with strong negative opinions.

- **Technology:** Learners are only issued a Level 1 once roster is completed in the LMS, hence any data entry errors could result learners not receiving link.

- **Evaluations:** Level 1 evaluation format and questions changed during the course of the study, future studies could be improved through use of consistent evaluation format.

- **Open Ended Responses:** Open ended text responses from learners were not analyzed during this study. Future studies could be improved through a mixed-method or qualitative analysis to better understand learner experience and impressions.

Conclusions

- The findings of this research show a pattern of positive learner perceptions of virtual courses after the trainer has received additional training on virtual facilitation techniques and adult learning theory.

- Concepts from the literature related to application of adult learning principles in general, and specific guidance for the online classroom were supported in the findings.

- Although future study is needed to further explore this topic, the present study has enhanced the understanding of the relationship between application of adult learning principles in the online learning space, and positive participant experiences.

Appendix

Content Relevance to Job Category

Question Text
I had sufficient opportunities during the training to apply and practice the concepts and skills presented.
This session has increased my ability to perform my current job.
Training activities reflected real world, on-the-job situations.
I plan to use this information in my current job.
The material covered is relevant to my job.
I would recommend this training program to a colleague in a similar position.
Select the statement that best describes examples and activities in the course.

Learning Objectives Category

Question Text
The learning objectives were clear.
The facilitator clearly explained the program objectives.
I had sufficient opportunities during the training to apply and practice the concepts and skills presented.
Select the statement that best reflects your ability to apply information.
The facilitator clearly explained the program objectives.

Learning Technology Category

Question Text
Did the learning environment and/or technology support your learning?
Select the statement that best describes the use of technology in this course (if applicable).