Assistive Technology and the Impact on Occupations

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BACKGROUND

- *Assistive technology (AT)* is any item, piece of equipment, or software whether acquired, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities (IDEA, 2004).
- **AT supports daily occupations** in the home, school and community and falls within the occupational therapy (OT) scope of practice (AOTA, 2016).
- **Current AT literature** has focused more on performance skills enhanced by AT (e.g. increased spelling, writing or communication skills). *Yet, the research is limited in examining the lived experience of AT users, the meaning AT holds in daily occupations, and the OT role* (Flanagan et al., 2013; White & Robertson, 2015).

RESEARCH QUESTION

How does AT influence the lived experiences of the end user in his or her occupations in different contexts (school, at home, and in the community) from the perspective of the client, family, and service providers?

METHODOLOGY

- **Participants:** A convenience sample of 5 school aged individuals (12-21) currently using AT (end users), 6 parents, and 4 service providers.
- **Qualitative Analysis:** 12 audio/video semi-structured interviews (10 individual, 2 focus groups). Interviews transcribed verbatim, coded in Dedoose©, and analyzed using the Constant Comparison Method to develop themes (Corbin & Strauss, 1990).
- **Reliability:** 25% of the total data coded via consensus to 100% agreement across 4 researchers.
- **Theoretical Framework:** Person-Environment-Occupation (PEO) (Law et al., 1996)

Occupational Performance — P, E, O
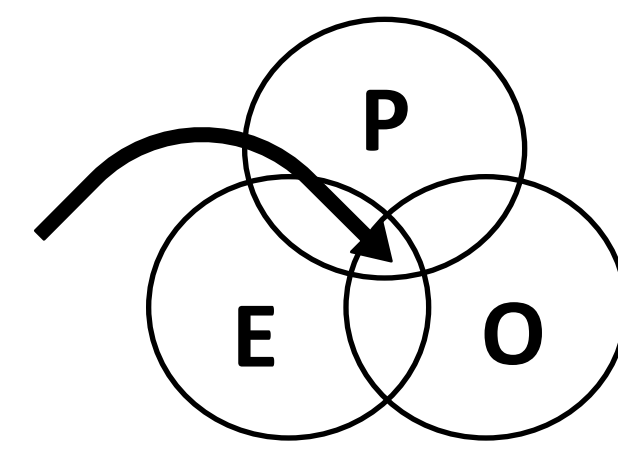
DEMOGRAPHICS, AT & ACCESS METHOD

Participants (Pseudonyms)	Demographics	Device	Access
Frenchie	Female, 12 yrs old, 7th Grade, Cerebral Palsy	Tobii Dynavox	Eye gaze
Secret Texter	Male, 17 yrs old, 12th Grade, Cerebral Palsy	Tobii Dynavox	Eye gaze
Rose	Female, 21 yrs old, College, Spinal Muscular Dystrophy	Tobii Dynavox	Switch (Joystick)
Miss Independent	Female, 17 yrs old, 12th Grade, Cerebral Palsy	Apple laptop & iPad	Direct Select (touch typing)
Adventurer	Female, 17 yrs old, 12th Grade, Cerebral Palsy	Apple iPad	Direct Select (index finger)

DISCUSSION
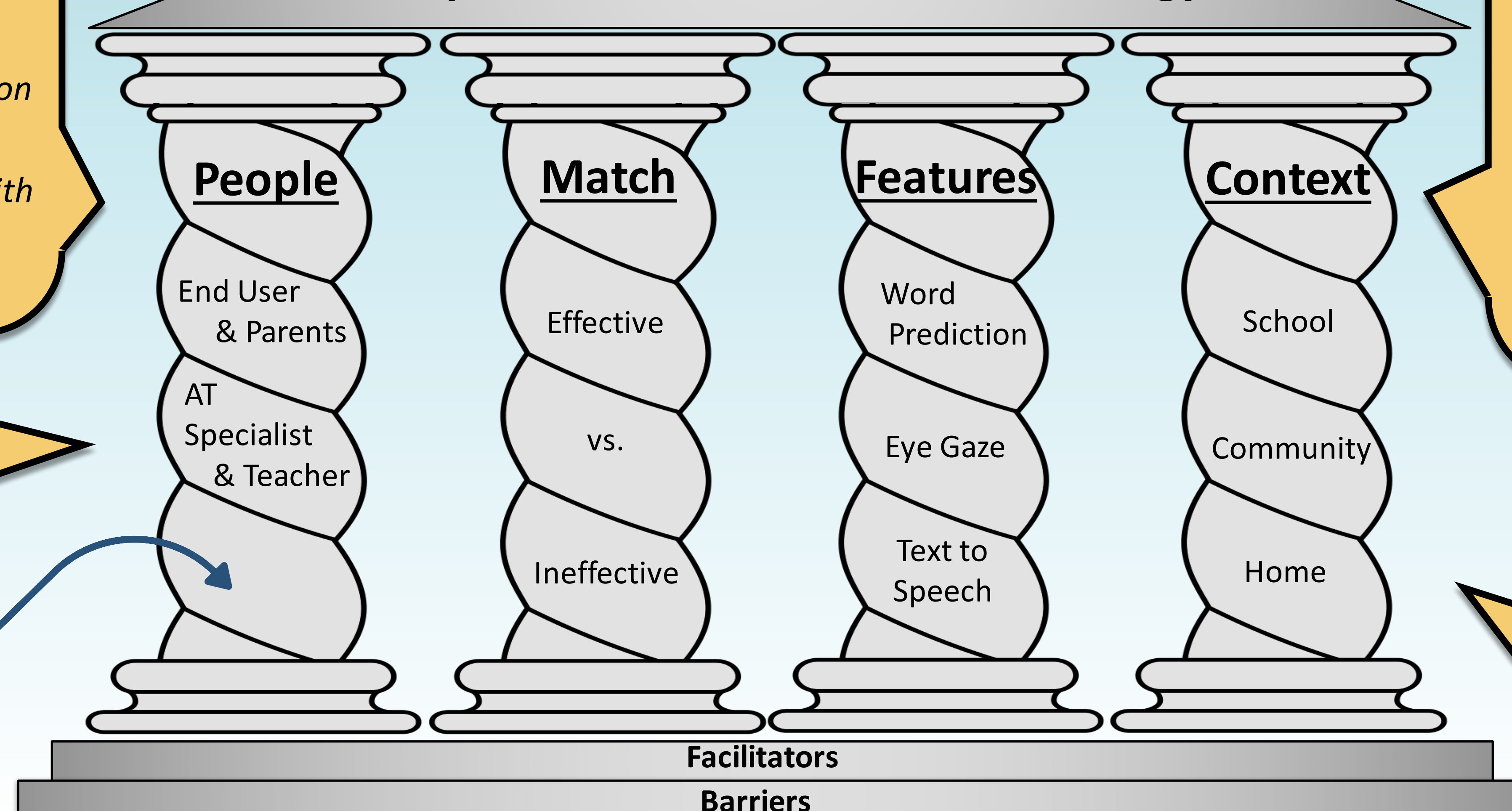
- AT has a markedly *positive impact on occupational performance and quality of life* for the end user and family.
  - **People**: Those involved with "making AT happen" in daily life include the end user, family, AT specialist and teachers.
    - **OT had very little involvement with this sample for AT applications (present use and AT history).**
- **AT Match:** AT features matching to client needs ranged from effective to ineffective, emphasizing the need for ongoing support to match person to AT.
  - **Features**: **word prediction, eye gaze and text to speech.** Yet, access methods could have been more efficient, which has significant implications for OT / AT services.
  - **Contexts**: AT supports occupational engagement in school (e.g. writing & reading), home (e.g. media), and community (e.g. travel & restaurants). AT supports the communication / socialization across all settings and contexts.
- **Facilitators and Benefits of AT:**
  - The *end user* along with a supportive and savvy network of *family and providers* contributes to putting AT into place for **occupational performance**, which has significant meaning:
    - AT brings forth individual spark and personality of the end user and **facilitates development of deeper relationships** with family, friends and those in the community.
    - AT **enables participation in educational engagement.**
- **Barriers to AT implementation and AT shortcomings:**
  - Logistics and lack of training can interfere with AT implementation.
  - Mounted devices on wheelchairs with eye gaze access can obstruct view, thus making conversations less natural.
  - Access methods can sometimes be inefficient, resulting in shorter expressions and long pauses in conversation.

RESULTS

> *The number one most important thing is it can change the human being's life. They can express their desires, their needs, their dreams, their personalities, their emotions. And then secondarily they can engage socially with someone else and that's kind of what humans are about. That's what we crave and need for life.*
> — Secret Texter Parent

> *The biggie is to see the dignity of the person that's behind the screen. I don't know if you've ever had the chance to sit down and talk with a communication system because you don't know what it's like until you walk a mile in somebody else's shoes. It's cool that the most important thing is what you see in every person, not just the person using the device.*
> — SLP

> *People should know how much [AT] can do for somebody. It allows the person with the disability to be on the same level as everybody else. Adventurer is using the iPad, going on Facebook and texting. She's no different than whoever is using it with her because it's all digital.*
> — Adventurer Parent

> *It helps me do everything. I can't live without it. I'm used to it. It's a part of me.*
> — Rose

> *I find it very helpful and useful because without it I would not be able to do like any of the assignments for school like any of the free time, like movies, games, TV, any of that. That would make my life very hard and very reliant on other people to help me do my work.*
> — Miss Independent

> *It has just really normalized her whole life and it has been really cool to see that. And you know, it's the tool that kind of dissolves the barriers.*
> — Special Ed Teacher

Occupational Performance
Occupational Use of Assistive Technology

People	Match	Features	Context
End User & Parents	Effective	Word Prediction	School
AT Specialist & Teacher	vs.	Eye Gaze	Community
	Ineffective	Text to Speech	Home

Where is OT?

Facilitators
Barriers

IMPLICATIONS FOR OT

- **AT is a central aspect of OT scope of practice**. More OTs need to become versed and comfortable using AT applications and becoming members of AT teams.
- OTs can offer specific expertise regarding positioning and access methods for AT.
- **AT is not a specialty area of OT practice, but rather part of the intervention toolkit for OT.**
- AT education should be substantial in OT preservice courses and not solely a topic for post-professional continuing education.

Selected References: Column [Online image]. (2018); Corbin, J. & Strauss, A. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage Publications; Dedoose Version 8.0.35, web application for managing, analyzing, and presenting qualitative and mixed method research data *(2018)*. Los Angeles, CA: SocioCultural Research Consultants, LLC www.dedoose.com; Flanagan, S., Bouck, E. C., & Richardson, J. (2013). Middle school special education teachers' perceptions and use of assistive technology in literacy instruction. Assistive Technology, 25(1), 24; Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004); Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The Person-Environment-Occupation Model: A transactive approach to occupational performance. Canadian Journal of Occupational Therapy, 63, 9-23.; Occupational Therapy Code of Ethics (2015). American Journal of Occupational Therapy 2015;69(Supplement_3):6913410030p1-6913410030p8; White, D. H., & Robertson, L. (2015). Implementing assistive technologies: A study on co-learning in the Canadian elementary school context. Computers In Human Behavior, 51(Part B), 1268-1275.