Thank you for being at this presentation. Name – I’ve work in adult ESL for over 20 years as a practitioner, curriculum developer, and teacher. recent grad of doctoral program at UMN – currently director of IDEAL Consortium, a project of the Ed Tech Center at World Ed Where we provide PD and technical support to ABE programs in the US on topics of classroom technology integration and online learning. This presentation is an analysis of a subset of data that I gathered for my dissertation research.

This study investigates the issue of English as the primary language of instruction in computer classes held in community technology labs and frequented by English language learners (ELLs). Taking a functional approach to describe language, I investigated instructional strategies employed to teach computer skills and the academic language used to do so.

This study was motivated by the idea that learning specific academic content requires learning the language used to describe it (Lemke, 1990) and that if teachers recognize where and how vocabulary and specific linguistic structures are central to success with academic content, they can determine how to best provide support for comprehension and help learners develop command of the language used in specific academic contexts.
I’d like to start with a story that illustrates the issue that drew me to this work. This narrative is drawn from my field notes from November 2013. The setting is a computer lab in a community-based organization that works hard to mitigate poverty in the city it which it’s located.

The students, including six English language learners (ELLs) from East Africa, Southeast Asia, and Central America, trickled into the computer lab, until all of the 20 computers were occupied. The learners had all been referred to the class at their intake session at the CBO. Several had come seeking housing assistance, two were seeking help finding employment. A few had just heard that there was a computer class. The six English learners possessed diverse levels of English language proficiency. One elderly East African woman seemed to have the lowest proficiency, she could say hello and ask very basic questions; she was also sight-impaired.

The workshop leader, a new AmeriCorps member, greeted everyone as they came in and handed out a seven-page document on the topic of the Internet, the instructional resource on which every minute of the class was to be based. The handout included screenshots of computers, websites, and Internet browsers, along with English text explanations of what would be covered in class, things like opening a browser,
understanding different types of broadband, and searching the Internet. She stood at her computer, which was hooked up to a projector, and for 90 minutes talked through the entire handout; the students, expected to click along, did their best. They listened attentively, searched for the screenshots that corresponded to what they saw on the big screen at the front of the room, and tried to follow the required ‘clicks’ using their own computers.

Though it was evident from the very beginning that not everyone could attend to her instructions or keep pace, could understand her language or see the tiny URLs displayed on the projected screen, the volunteer teacher marched forth, covering each page of the handout and delivering imperatives about when and where to click. I witnessed several of the ELLs try to ask clarifying questions to confirm verbal commands and attempt to recognize the letter names the teacher spelled out in an effort to get everyone on the same webpage.

By the end of the ninety minutes, the teacher looked exhausted. Trying to keep the learners on pace with the clicks had taken a great deal of effort and was frustrating. Most learners did not make it to the final summative, “the practice part” as the teacher called it, at the end of the lesson.

These are the learners and teachers that motivated this project. In the US many LESLLA learners study in formal education programs, with trained or licensed teachers. The capacity of these programs falls far short of accommodating all learners with such needs. Consequently, many go to CBOs to attend computer skills classes
These labs in CBOs provide much needed educational opportunities; however, the teachers working there are often minimally trained and struggle to support the learning needs of adults for whom English is not a first language and are challenged by the wide range of skill level and educational background of the diverse learners who show up.

Additionally, because they lack funding and expertise for materials development, CBOs depend on an assortment of web-based learning resources developed for literate English-speaking, learners. This research sought to better understand how to maximize the positive impact of the resources that are there – including how to best support volunteers or AmeriCorps member who often serve as teachers there. - particularly around issues of language and the role of language instruction in support of digital literacy skills development.
The methodology I used, Design Based Research (DBR) is collaborative, informed by and aligned closely with the needs and priorities of participating stakeholders to ensure the relevance of the process and the resulting intervention (Brown, 1992; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Wang & Hannafin, 2005). In addition to being collaborative, it is iterative and has both far and near relevance, solving a local problem and, in the process, arriving at theoretical conclusions. Theoretically, this DBR dissertation research contributes to disciplinary knowledge in the areas of digital literacy instruction and the English language proficiency required for it. The project thus simultaneously strives to solve a local problem while it contributes more generally to learning theories in order to support the extension of findings to similar educational contexts.

There are many different approaches to DBR, I’ve chosen two to guide the work. The first, Educational Design Research nicely frames the phases required for completion of design. A macro-cycle reflects the overall process for an EDR study. The meso-cycles that constitute each macro-cycle represent what McKinney & Reeves refer to as a regulative cycle: “problem; identification; diagnosis; planning; action; and evaluation” (p. 8) There is no fixed number of meso-cycles required for a macrocycle; rather, it depends on the scope of the research. Within each meso-cycle there are micro-cycles, which embody what the authors call
“logical chain of reasoning” (p. 78). Each micro-cycle allows for its own cycle of flexible and iterative exploration of ideas. This is illustrated by the circular arrow within each rectangle. McKenney and Reeves suggest that ‘analysis and exploration’ and ‘evaluation and reflection’, the first and third phases, are empirical cycles because they require data collection and analysis. The ‘design and construction’ phase is informed by the empirical study that preceded it but does not “by itself” constitute an empirical process, rather it will “follow a sound, coherent process to produce an intervention in draft, partial, or final form” (p. 78). For this reason, I paired EDR with a second DBR approach – conjecture mapping.
DELETE?
As in all qualitative research, the methodology I’m using DBR, requires work to rest on a theoretical foundation, including grand theories that give us a shared language for describing current and emergent knowledge --- In this case, because I’m talking about teaching and how learning is mediated, I rely on sociocultural theory that rests on the work of Leon Vygotsky, where the organic (the brain) and the cultural both impact the mind, leading, over time, to development and learning (Lantolf & Poehner, 2008).
More specifically, I draw on Engeström (1999) and his activity system model, which illuminates well the impact of environment impact on learning. It is comprised primarily of: Subject – the one engaged in an activity , Object – the intention of the activity or the goal, AND Tools and signs – anything used to complete the activity (computer, language, curriculum).
Additionally, several components impact the way that subjects use tools or signs to affect the object: Community, rules, and division of labor.
Together, each part of the activity system contributes to shaping how the activity of the subject results in an eventual outcome (Engeström, 1999). All components are at play in determining the shape of that outcome. The activity system in my research is each of the participant site classrooms, where the ‘subject’ is the TAC member, the
‘object’ is learners, the ‘mediating artifacts’ include instructional strategies and resources, and the ‘outcome’ is computer skill development.
it’s useful to have a bridge between the orientating framework and ideas about design. A framework for action provides concrete focus that shapes design and serves as a heuristic for determining impact. Frameworks for action are significant because they help us manage a gap between theory and design. Silver-Pacuilla and Reder’s 2008 literature review defining minimal skill level for learning online determined that what is needed is an equitable distribution among three areas: learner skill, support available, and the demands of a task. This framework not only provided important foundational knowledge that sharpened the study design, it also points to a gap in research; – one of the goals of this study was to determine how to provide an equitable distribution amongst these three components when working in the particular context of this study: CBO computer labs supported by minimally trained teachers attending to a diverse range of adult learners.

This lead me to my overarching research question.
Summary of important prior research

**SFL and Academic Language**

*Functional approach to SLA and developing academic language*
Schleppegrell & O'Hallaron (2011)

*Academic language in diverse classrooms and for ELLs*
Gottlieb & Ernst-Slavit (2014).

*Critique of academic language pedagogy*
Faltis, Christian, J. (2013). Demystifying and questioning the power of academic language

**SFL**

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**L2 Vocabulary Instruction**

*Vocab instruction for English Language learners*
Graves, August & Mancilla-Martinez (2012).
McKeown & Curtis (1987)

*Vocab and reading or knowledge*

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Schleppegrell, M. J. (2013). The role of metalanguage in supporting academic
language development. Language Learning, 63(March), 153–170.
http://doi.org/10.1111/j.1467-9922.2012.00742.x
Fitts, S., & Bowers, E. (2013). Developing academic English with English language
learners. In M. Arias & C. Faltis (Eds.), Academic Language in Second Language
Learning (pp. 27–56). Charlotte, NC: Information Age Publishing.
Gottlieb, M., & Ernst-Slavit, G. (2014). Academic language in diverse classrooms:
Zwiers, J. (2007). Teacher practices and perspectives for developing academic
http://doi.org/10.1111/j.1473-4192.2007.00135.x
Zwiers, J. (2013). Building academic language: Essential practices for content
Faltis, Christian, J. (2013). Demystifying and questioning the power of academic
language. In M. B. Arias & J. Faltis, Christian (Eds.), Academic Language in Second
Routledge.
London: Continuum
Academic Language

“...the language of school related to acquiring new and deeper understandings of content related to curriculum, communicating those understandings to others, and participating in the classroom environment. These understandings revolve around specific dimensions of language use including discourse, sentence, and word or expression levels within sociocultural contexts.”

(Gottlieb & Ernst-Slavit, 2014, p.189)

Academic language is an important construct for considering adult language learning contexts, including those focused on digital literacy. AL is an approach to thinking about language that views the language of schooling as the means by which to support learning of academic content. Gottlieb & Ernst-Slavit (2014) provided a useful current and very useful definition of AL:

The concept of academic language can be located in several theoretical perspectives in SLA: cognitive, functional, skills-based, sociocultural, and social action.
Understanding a parallel line of inquiry on vocabulary teaching and learning is necessary to analyze the instruction observed for this study. Though much of it focuses on either K12 or higher-level L2 vocabulary development, it is useful for theorizing the role of vocabulary with low-level ELLs in computer classes, particularly the literature that characterizes what it means to have knowledge of words.

A useful frame is this spectrum of depth of knowledge from Beck, McKeown, and Omanson (1987), as illustrated here. It shows their theory that Knowing a word is also understood as a continuum.

In related work they wrote that a person starting with no knowledge of a word gradually progresses to eventually understand its meaning and make use of it in a variety of settings. Knowing a word may also mean knowing the connection of words to broader concepts, topics, or situational discourse where words are relevant or useful (Miller, 1978 as described in Beck, McKeown, and Kucan, 2013).

Perfetti (2007) in his writing on lexical quality hypothesis, articulated specific features required to true know a word, for example: semantics, phonology, orthography, morphology, and syntactic rules. Perfetti also suggested that hearing a word and
becoming aware of its meaning likely triggered mental connections to past experiences or relations to prior knowledge and that the resulting abstract representation made it possible to make meaning of a word in a new context. If one could draw on relevant prior knowledge, he or she was essentially providing a form of familiar context, cuing a personal schema to support understanding the word. This is a problem for learners touched by my study, who had little prior knowledge with the content, which made connections to schema either difficult or not possible at all.
Also challenging for my learners was the number of exposures required to learn a word.

Graves et al. (2012) wrote,
... studies of learning from context show that context can produce learning of word meanings for both native English speakers and ELLs, that the probability of learning a word from a single occurrence is low, and that the probability of learning a word from context increases substantially with additional occurrences of the word (p. 21).

So, how might one overcome this challenge? Beck et al. (2013) pointed out that students needed to develop an interest in learning vocabulary, to encourage them to notice new words in their environment and to start to reflect on how words are related conceptually. Atkinson theorized that, from a sociocultural perspective, learning is “a default state of human affairs. If we constantly and sensitively adapt to our environments, then learning is continuous, at least insofar as durable adaptive change occurs in the learner–world system” (Atkinson, 2011, p. 144). So, tuning-in students to representations in their daily life of the skills and vocabulary they hope to master can support learning.
This prior research leads to questions.....

• What are the particular lexical structures (i.e., vocabulary) evident in classroom discourse of digital literacy?

• How do corps members draw on key vocabulary in their instruction?
Schleppegrell (2004) adopted a functional approach in her work on academic language. Successful application of AL requires identifying the configuration of grammatical structures that are typical, expected, or socially relevant in any context. By doing so one can define the register, “the configuration of lexical and grammatical resources which realizes a particular set of meaning” (p. 46). Drawing on Halliday, Schleppegrell (2004) presented the following structure for organizing elements of a register.

Utilizing academic language as a means to support the academic development of adult ELLs provides scaffolding that supports language development, the learning of content knowledge, and nurtures identity as students. For example, in an age of technological ubiquity, where learners have been found to privilege building computer skills over English language learning, as pointed out in Chapter 3, a pedagogy based on known academic language can invite learners to participate in language skill development that at the same time gives the valuable skills needed to participate in daily life. Hence, AL holds promise as a means to provide adult ELLs with relevant input to engage as a both a learner and legitimate participant in broader world by elucidating the language required to fully engage in learning by affording the cultural capital the language holds (Pierre Bourdieu, 1991). Zwiers
(2013) wrote that such capital is critical for knowing what to say, do, or write in an educational setting.
This is a qualitative case study of the language used in instruction in two basic computer skills classrooms in two of the six focal sites represented in the larger dissertation study, Newcomer Home and Ascend. Case study is commonly employed in SFL research, where context is critical for determining meaning of language. (Schleppegrell & O’Hallaron, 2011). For this study, I focused on representations of “field,” the ideational choices presented in instruction in the two sites and by comments about teaching made by the participants in focus group discussions. Particularly important in this context are those nouns and verbs that constitute the vocabulary of the basic computer skills classes observed. Vocabulary is an important component of ideational choices in language use. Schleppegrell (2001) writes Vocabulary is an obvious feature of register differences, as it is the lexical choices that realize the ideational content of the text. Through lexical choices, students also situate themselves as members of particular discourse communities, displaying their ability to adopt the lexis of the field. (p. 438)

The study sought to define the vocabulary employed in basic computer skills classes.
In qualitative research, the researcher is an important part of the analytical process, so a researcher’s positionality impacts the analysis. For this study, I was situated as a participant observer and researcher known by the participants as seeking knowledge about how to best support ELLs in digital literacy classes. When needed, I helped both the participant AmeriCorps members and their students. This was an ethical choice stemming from my opinion that persons with expertise should contribute when put in a position to do so.

The TAC members who staff the computer lab who, though they have been successful students, had little formal training in teaching and were at times unaware of the issues that served as barriers for the ELLs in their labs. Therefore, I was actively engaged in supporting both the learners and the service corps members during my time at the CBOs. This positioned me as observer, participant, and facilitator - combined together I argue made me an engaged researcher in the settings. I think this positionality would place me in a number of places in the Activity System model.
To account for the vocabulary required for participation in basic computer classes, I analyzed data from recordings of classroom observations and focus group discussions, which included data from conversations where participants described their beliefs about the role of explicit language instruction in the classroom and the relationship between English language proficiency and digital skill development. I took note of language used to describe the content skills that served as the focus of skill instruction, the explanatory language used to make those content skills clear, and instructional strategies employed to teach them. I also analyzed any artifacts employed in instruction of the focused computer skills. This data is reflected in Table 5.1 below.
Using these mythology combined, my goal was to collaboratively create a resource to help support ELLs in community-technology labs; deepen theoretical knowledge on teaching in this context. To do this I needed to answer the question: What is needed to make instruction accessible for ELLs in community technology labs.

The participating sites are all part of the same umbrella AmeriCorp program, Which I call Technology Access Collaborative or TAC. TAC serves over 30 organizations in metro area in which it is based; it’s mission is to support digital literacy for adolescents and adults. The sites I chose represent the range of CBOs that host TAC AmeriCorps members. Though each played a role informing my work, the two organizations serving the most low-level ELLs were the most generative.

These sites are listed in this graph - named by pseudonym - and defined by characteristics of the learners who attended the computer classes led by the TAC members.
11. The participants of the study were the collaborating stakeholders who experienced the instructional challenge - they were a convenience sample, who actually self-selected to join to support their AmeriCorps work. Each year TAC asks its AmeriCorps members to participate in a community engagement project - to leave some legacy of their year of service. The goal of this group’s project was to create resources to make it easier to teach ELLs in TAC sites. As you can see none of the TAC members was a trained teacher and for the most part, did not share the home language of the students they supported.

All of the TAC members introduced in Chapter 2, except Leanne who was only available for the pilot study, participated in the focus group discussions as part of the larger study, but the data presented here draw primarily on contributions from the two participants who provided instruction to low-level ELLs, Erik and Marty. At Ascend, Erik offered classes to adolescents and adults supporting workforce training and computer skills with the goal of helping community members achieve economic and social stability. Instruction in the computer lab was characterized by a rolling cohort with very few learners coming every day and no way of knowing who will attend each day. Marty’s work Newcomer House was a bit different, in that Newcomer House enrolled ELLs in formal English language learning and provided
computer classes to supplement language classes. These computer classes were several weeks long and supported a cohort group of students that remained largely intact throughout the course, with new students joining in along the way.
I coded these data using in two cycles. I used first cycle coding identified by (Saldaña, 2012) as descriptive, creating categorical labels. As I moved through transcripts, audio files, and field notes, I identified relevant themes, resulting codes like Learning, Computer skills, Attitude, Social capital, Investment, and Teacher-centered. I also integrated demographic data into my coding to better see patterns in the data and to shape observations. Next, I drew on data from online assessments and online learning activities to further inform my understanding of the work of the learners in the program. I went through a second cycle creating subcodes to better draw out salient themes.

I used the qualitative research software MaxQDA to support an analysis of my codes - showing me where in these data salient themes were represented. This process was not quite as linear as it sounds - as I needed to repeat the process of coding and use of analytical tools iteratively, until my findings became evident.
Data were qualitatively coded in a multicycle process (Saldana, 2012). In cycle one, I applied structural codes, for example Language analysis, Instruction of content, and Needs to draw out data that represented use of language or instruction of the language or digital literacy. First cycle coding also included what Saldaña referred to as attribute codes, used for marking useful demographic information about learners and context, for example: Student info, levels, ELLs, class demographics. I took a second pass still drawing on first cycle codes for as Saldaña (2012) suggests, “a more attuned perspective (p. 10). During this phase of coding, I applied descriptive codes to flag immediate salient themes within this subset. Table 5.2 shows the codes employed in both cycles that are most relevant for this part of the research.
As I analyzed field notes, analytic memos, transcriptions of focus groups and class observations, and classroom artifacts to answer the question: *What are the particular lexical structures (i.e., vocabulary) evident in classroom discourse of digital literacy?* I noticed ample data that informed identification the key vocabulary in this context. Illustrated in the table, which shows the frequency of codes (the first row of the table) for each data source.

I didn’t code lg of instructional materials – would have been double counting because it was consistent w/ what was found in Observation notes and transcripts.
Diving into each coded group of data revealed a common theme; these data suggested that the ‘field’ in this context was constituted by key vocabulary articulated in skills tested in the Northstar Digital Literacy Assessment. Each of the participating agencies used the assessment as an outcomes measure, TAC members were encouraged to provide instruction that supported growth on the assessment. The standards on which the assessment is based, therefore, motivated the vocabulary used in the classroom. Evidence for this finding was most neatly reflected in a comparison of the instructional materials from the focal site, Ascend, and the actual Northstar standards.
Focus vocabulary drawn from Northstar

*Coincidence of key terms and concepts in course materials and assessment standards*

<table>
<thead>
<tr>
<th>Skill area</th>
<th>Number of times class terms are articulated in both standards and materials</th>
<th>Number of times class terms are articulated only in materials; but implied by standards*</th>
<th>Number of standards not covered in class materials</th>
<th>Number of terms articulated in class materials but not in standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Word</td>
<td>24</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Computer Basics</td>
<td>26</td>
<td>12</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

*Terms used in course materials reflect more detail than what is articulated in the standard, but teaching standard necessitates use of the term.*
So the standards on which the assessment is based motivated the vocabulary used in the classroom.
Varied Language Employed in Explanations. Beyond the focus on vocabulary motivated by the assessment, there was not much consistency in the language of explanation that TACs provided to support instruction of the skills.

At Ascend and Newcomer House, explanations that students received for different skills generally started with a group presentation led by the teacher and then shifted to individual practice supported by one-to-one help when needed. Explanations provided in the whole group instruction were hardly ever just explicitly articulated, but were supported by slides and demonstration of the skill.

The one-to-one support that followed depended on the learner’s needs, from casual observation to literal handholding as the facilitators monitored practice. Each corps member seemed to tailor their explanations to their community of learners. Because these students varied, the explanations had to vary too. Additionally, each of the sites had volunteers who volunteers came with their own way of describing things.
The end goal of this functional analysis was an understanding of the key vocabulary employed during instruction in computer classes. The second focus of inquiry, then, investigated whether or not and how the vocabulary of computer skills was made accessible to learners by answering the following question: *How do service corps members draw on key vocabulary in their instruction?* The data from the two sites serving low-level ELLs, Newcomer House and Ascend again, provide the most elucidating data. The most useful finding presented here was a shift in the corps members’ perception of the role of vocabulary development in instruction.
**Starting point: Vocabulary not a focus**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Donna</td>
<td>I’ll explain something in English and one of them with higher proficiency in English and who gets</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>the concept will turn to others and will explain everything I just said in Somali. And they’ll be</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>like OK I understand. So, the goal is for them to take that home [inaudible].</td>
</tr>
<tr>
<td>4</td>
<td>Erik</td>
<td>That’s almost want you want to have happen in a classroom. What you just described.</td>
</tr>
<tr>
<td>5</td>
<td>Donna</td>
<td>Yeah</td>
</tr>
<tr>
<td>6</td>
<td>Erik</td>
<td>That’s I think maybe best case scenario, though maybe the one thing you hope for is that then</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>eventually they start learning terminology to associate with that concept.</td>
</tr>
</tbody>
</table>

(Transcript from group, January 8, 2016, minute 3:40)

**Starting point: Vocabulary not a focus.** At the beginning of the study, these data suggest that vocabulary instruction was viewed as secondary or attendant to the skills instruction, rather than the focus of instruction. For example, in the first focus group meeting there was an acknowledgment that language was an issue in teaching computer skills, but there was no conversation about how language instruction or vocabulary support should figure into instruction.

The transcript shows that there is an awareness that language comprehension is an issue when teaching computer skills in L2 English and that conceptual understanding is the goal of instruction. In lines 1 and 2, Donna provided a strategy (i.e., relying on a more proficient learner to leverage L1 for explanation) and Erik suggested the desired outcome of that or any strategy they employ in their computer classes is a conceptual understanding of the skill associated with the language. His comment in line 6 illustrates his belief that terminology is secondary to skill, that “eventually” acquisition of the vocabulary will happen.
Early shift: Considering vocabulary. Language was not again represented directly in focus group data until two months later. In answer to the prompt from the researcher, “So, let me ask a follow up question; you guys have talked about technology as the content. To what extent is English language the content that you're teaching? What do you think?” The TAC member answers represented in the transcript suggest that there had been some growth in their understanding of the role of vocabulary specifically in the instruction of computer skills. Erik responded as follows: “The first day of my class in particular is just, what is this called? It’s called a mouse. What is this called and then to learn the functions before that they have to understand why it’s called that...” (Focus group transcript, March 18, 2016, minute 9:07). Note that though the question asked about language more generally, the response was focused specifically on vocabulary.

Later in the same transcript, there is more data representing how they approached the language issue at the time, again showing vocabulary as a focus. This final excerpt shows further evidence that the focal participants, in this case Marty, were beginning to think about skills and vocabulary as connected.

Classroom observation data also support these observations about early efforts to integrate vocabulary in support of computer skills, and how their work shifted over the months of the research.
**Vocab embedded in instruction**

*Erik’s work at Ascend.* Data from parallel lessons taught by Erik show how his thinking about vocabulary building shifted. In the first lesson, taught on April 4, 2016, vocabulary was embedded into the skills instruction. This finding was elucidated through descriptive coding process applying the labels: *Activities, Articulation of skills,* and *Vocabulary instruction.* In his lesson, key terms were included on PowerPoint slides projected to a presentation screen, as seen in Figure 5.5, and introduced as he talked through the slide. This instruction included some provision of definitions and comprehension checks done with display questions all supplied in large-group cohort instruction.

The slide shows a screenshot of the Ribbon in Microsoft Word, seen along the top of the screen. Underneath that, it shows blown up images of the formatting options featured on the ribbon, for example B, I, and U, which are labeled underneath the icons (i.e., “Bold”, “Italics”, and “Underline”). This intentional but very limited introduction showed some effort to support vocabulary development; however, vocabulary was not the focus of the class.
Recognizing the importance of vocabulary instruction. Data from both Newcomer House and Ascend suggest that as time progressed Marty and Erik began to allow more time for focused instruction and practice of vocabulary and attendant skill development.

Erik’s instructional slides -- spring of 2016
Data from Erik’s class on the same topic three months later shows that over time, Erik began to integrate activities to support vocabulary instruction in more ways. This shift is evident in the table. The table shows that the class taught on June 17 included each of the instructional activities observed in the earlier class, plus a demonstration and extra vocabulary review activities. It also featured concepts presented one at a time, rather than several terms at once, as happened in the earlier lesson.
More practice resources
This is where we are now.
More practice resources

Glossary added to web resource – DiHo for self reference and extra practice
Impact of more focus and practice

*I also saw how people reacted to the beginning vocabulary [page] which I think went really well. Because it gives people sort of a needs assessment, allows them to assess themselves on where they’re at and words they know and then the can fill in the blanks and then we can review it as an entire class. So, I will continue to build out the website as it continues and do my best to make it user friendly.*

As the TAC members observed each other teach throughout the needs analysis and reflected on their own teaching, it became clear that they need a glossary as part of their explicit focus on vocabulary. In his field notes from mid-June, Erik wrote this observation about the impact of the glossary - “I also saw how people reacted to the beginning vocabulary [page] which I think went really well. Because it gives people sort of a needs assessment, allows them to assess themselves on where they’re at and words they know and then they can fill in the blanks and then we can review it as an entire class. So, I will continue to build out the website as it continues and do my best to make it user friendly.”

The glossary was an important part of the instruction and practice, which became more complex over the course of our time together. In field notes documenting a debriefing conversation after class on my last visit, Marty observed that, over the 17 months she had been at Newcomer Home, she had realized the importance of making time for ample vocabulary support. To make this possible, she said that she had slowed down the pace of the assessment cycle from three instructional hours before an assessment to 40 hours, with nearly half of those hours dedicated to vocabulary development and other language required to make use of computer.
Finding Q2 - Pushing understanding of concepts

So I said **the literal are the words**, the actual words sometimes. **The physical is like a computer like this** [demonstrates something you can touch]. **The virtual is the presentation I make** on a web interface or on a PowerPoint **and then a conceptual is what they do**. And the literal to the physical and the literal to the virtual make complete sense people get that. They know how to name things very quickly. We learn that quickly and then I try to go to the conceptual, like from the word to the concept and that's the least connection, like that's where I'll lose people.

Erik - Focus Group 16.06.24

What accounts for this shift? I think the Corps members were arriving at a more sophisticated sense of the role of language, specifically key vocabulary, in their learners’ skill development. Shown in this excerpt from a focus group transcript.
Clues about what it means to know a word

1 Jen [Clarifying question about concept map Erik drew] So, for example they might be able to succeed in a mousing activity but if you asked them to do something in a Word exercise they won’t be able to do mousing?
2
3
4 Erik Yes.
5
6 Jen Or their inability to use [physical manipulate] with the mousing or the conceptual understanding in mousing gets in the way of actually being able to like make a word bold because they can’t pick and drag to highlight?
7
8
9 Erik Yeah exactly and to me the conceptual means the ability to transfer that knowledge to other things. And that’s how I define it at least … So basically, the X is where I kind of lose people. So, then after I noticed that words [his literal] to concept doesn’t work, I’ll try to go physical or virtual to concept, so then I try to show them this or say, “What does it do?” That still doesn’t work. And so I’m, I think I’ve kind of hit a wall in my teaching, is the ability to get to the conceptual level.
10
11
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15 Marty Oh, I totally identify with that.

(Transcript from focus group on June 26, 2016, minute 26:00)
What is it to know a word? Excerpts

- Erik: ... to me the conceptual means the ability to transfer that knowledge to other things. And that's how I define it at least.

- Erik: I have an example ... let's use for example Bold in Microsoft Word. Almost all my learners can identify and name it and show you where it is and they can't tell me what it does exactly, but they can do it. Then we go to email and I'll point to the B and people won't be able to tell me what its for.

- Marty: Thinking about like you're lack of students not be able to apply skills across the cross context. With the Northstar my students will look at the click and drag question and say I've never seen this before teacher. [I say] I do this every day you guys. But seeing it in it in the assessment. It's just so difficult

(Transcript from focus group on June 26, 2016, minute 26:00)

The corps members developed a sophisticated understanding of what it means to know a word.
They came to realize that understanding a concept is complicated. The notion of “concept” was introduced by the corps members several times in data presented above. They used the term as a practical description of the knowledge of a vocabulary and its associated skill in this context. Though they had not intended to, they hit upon a very useful theoretical construct in sociocultural theory. Vygotsky (1987) also used a Russian equivalent of the term; he equated “concept” as a way to frame a word’s meaning, defining concept as a thematically unified entity that encompasses individual elements. He suggested that the meanings attributed to words are abstractions that gain meaning through observing its use and interaction (mediation) in a particular context. He understood that knowing a word’s meaning reflects an understanding of the development of one’s consciousness and an understanding of a concept. Vygotsky wrote that the development of concepts or word meanings presupposes the development of a whole series of functions. It presupposes the development of voluntary attention, logical memory, abstraction, comparison, and differentiation. (p. 166)

The development of conceptual knowledge, while supported by instruction, also requires lived experience to make the abstract more personal and comprehensible. Vygotsky noted that this required practice, activities necessary for the development
of concepts. Practice is a social process because a person works toward development of cultural practice. It is mediated by use of tools and activities that focus attention on desired knowledge.
The development of conceptual knowledge, while supported by instruction, also requires lived experience to make the abstract more personal and comprehensible. Vygotsky noted that this required practice, activities necessary for the development of concepts. Practice is a social process because a person works toward development of cultural practice. It is mediated by use of tools and activities that focus attention on desired knowledge.

If we constantly and sensitively adapt to our environments, then learning is continuous, at least insofar as durable adaptive change occurs in the learner–world system” (Atkinson, 2011, p. 144). So, tuning-in students to representations in their daily life of the skills and vocabulary they hope to master can support learning.

The data from this study showed that this theoretical interpretation of what it is to know a word or, rather, concept, is reflected in the efforts demonstrated by both Marty and Erik in the final months of the research process. Within what was possible at their respective sites, given learner demographics and the environment of the lab, each corps member, in some measure, arrived at the realization that simply knowing a word was not enough to support computer skill development. Consequently, each added instructional strategy expanded upon the direct instruction critiqued in the quote above to provide focus and mediated activities to offer a semblance of practice or lived experience necessary for the learners to not only understand the vocabulary
and skills but also reach the conceptual level of understanding necessary for transferring those terms and skills into new contexts.
This research adds a layer of complexity to research on vocabulary.
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