INTEGRATION OF INNOVATIVE TECHNOLOGY AND LINGUISTICS IN EDUCATION AND DISABILITY SERVICES

Chiquita D. Howard-Bostic, Ph.D., Faroat Andasheva, and Jessica E. Smith

Context

Given increased admissions of students with disabilities among postsecondary educational institutions, there has been a call for complete accommodations with regard to course material. However, many universities have not mandated full accessibility. Making online learning accessible to anyone is economically realistic, as everyone may need accessible technology as the population grows older.[4]

Innovative technology and linguistic tools enrich learning experiences for students, especially those with disabilities. 74 students enrolled in *three* courses (General Sociology, Intro to Criminal Justice, and Juvenile Delinquency) access transcriptions, audio lectures, and student-shared classroom notes online via a computer or telephone. This intersection of modern technology and learner-centered pedagogy allows for greater accessibility of information in many formats and environments regardless of a student's learning style.[15]

Transcriptions of class lectures, in particular, allow students with learning disabilities an important connection to information that they may not otherwise grasp. The audio provides interpersonal contact in the online learning environment. Comprehensive classroom notes encourage a more complete student-centered understanding of the material.

Discussion

Embracing Linguistics

- **Environment**: Students experience a more relaxed atmosphere, greater understanding of course material, and lower stress/anxiety.
- **Experience**: Students view the course positively and have multiple opportunities to demonstrate their learning.
- **Participation**: Linguistics enhances focus on course materials, accessibility for self-paced learning, and equitable student participation.[13]

Disability Services

- **Need**: In 2008, students with disabilities represented ~11% of all postsecondary students;[4] having one or more disabilities.[15]
- **Accommodations**: Persons with visual impairments are least frequently served.[1]
- **Retention**: Cognitive/knowledge disadvantages lead to drop outs or longer graduation timelines.[6]

Student Note-Sharing

- **Collectivity**: Digital collaboration spawns critical thinking, productivity, recall, and preparation.[17]
- **Skills**: Job placement programs disseminate additional printed material.[3]
- **Support**: Aids low-vision students by deciphering text material and descriptions
- **Standards**: Increase standards and peer support across different learning styles[5]

Multi-Media Assistive Technology (MAT)

- **Planning**: Establishing accessibility at the time of course creation is less difficult and time-consuming.
- **Teacher Resources**: Assistive devices are present in most postsecondary support services settings.
- **Course Preparation**: MAT generates efficient and fast means of addressing difficulties.
- **Accessibility**: MAT increases availability of resources and flexibility of time.[12]
- **Audio transcriptions**: MAT enhances teacher expression and aids low vision and second-language learners.[4]
- **Knowledge**: Students comprehend material and better perform specific tasks.
- **Student Productivity**: MAT boosts, maintains, and improves students' functional capabilities and increases student engagement
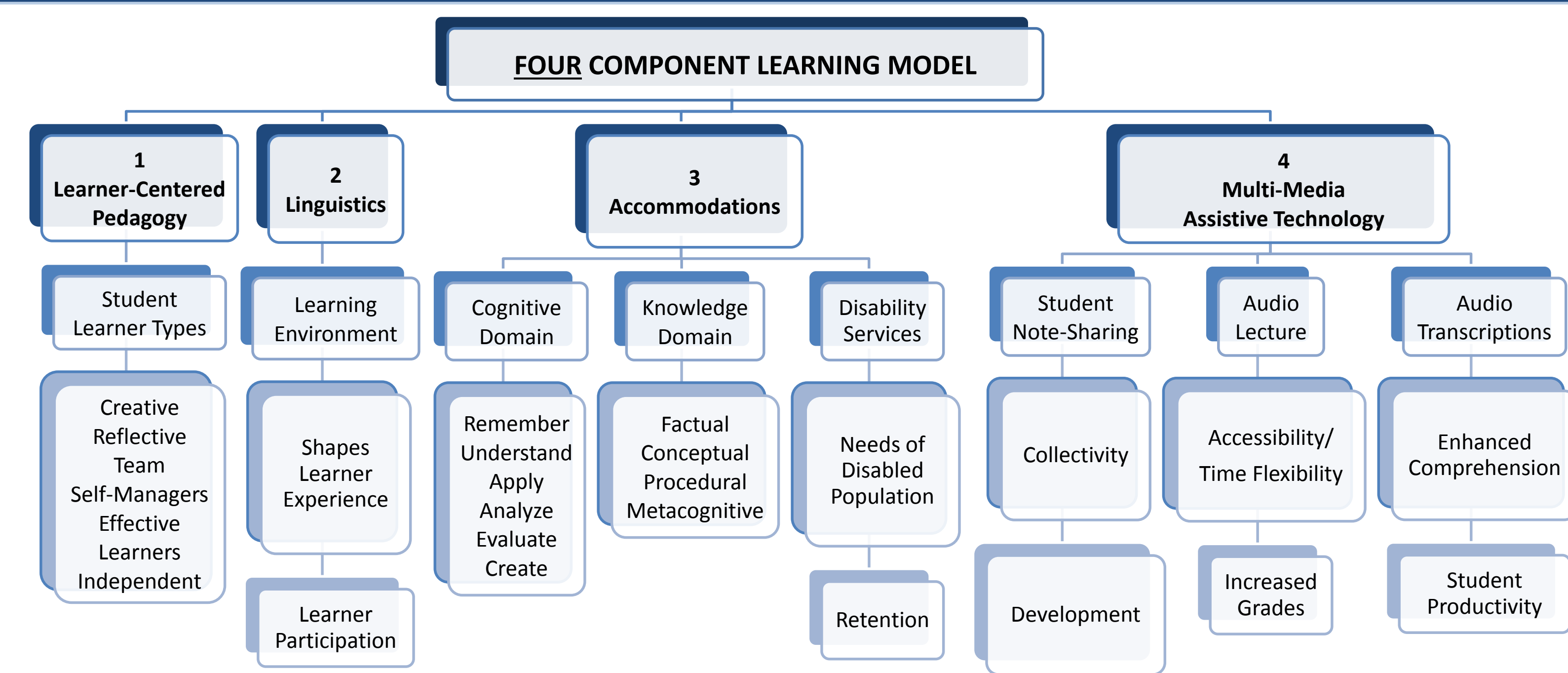- **Grades**: Integration is likely to result in grade improvements.[16]

Purpose

This project supports universal accommodations. Shared notes, audio lectures, and audio transcriptions shift teacher-centered learning to student-centered learning. By sharing these tools online, students can adapt in a healthy way, obtain ideas effectively, and take responsibility for their learning.[13] These online accommodations have been significantly useful to students during their learning experience.

Student Perceptions

USE OF AUDIO	FREQUENCY	PERCENT
Very Frequently	1	1.4
Frequently	14	18.9
Occasionally	34	45.9
Never	22	29.7
N/A	3	4.1
TOTAL	74	100

USEFULNESS OF TRANSCRIPTIONS	FREQUENCY	PERCENT
Very Useful	43	58.1
Somewhat Useful	26	35.1
Not Very Useful	5	6.8
TOTAL	74	100

USEFULNESS OF SHARED NOTES/STATUS

		ACADEMIC STATUS				TOTAL
		Y1	Y2	Y3	Y4	
	COUNT	20	9	21	18	68
AGREE	% Within Status	90.9%	90.0%	100.0%	100.0%	95.8%
	Count	2	1	0	0	3
DISAGREE	% Within Status	9.1%	10.0%	0.0%	0.0%	4.2%
	Count	22	10	21	18	71
	% Within Status	100.0%	100.0%	100.0%	100.0%	100.0%

Innovative Technology Learning Model

FOUR COMPONENT LEARNING MODEL

1. Learner-Centered Pedagogy — Student Learner Types — Creative Reflective Team Self-Managers Effective Learners Independent

2. Linguistics — Learning Environment — Shapes Learner Experience — Learner Participation

3. Accommodations — Cognitive Domain (Remember Understand Apply Analyze Evaluate Create), Knowledge Domain (Factual Conceptual Procedural Metacognitive), Disability Services (Needs of Disabled Population, Retention)

4. Multi-Media Assistive Technology — Student Note-Sharing (Collectivity, Development), Audio Lecture (Accessibility/Time Flexibility, Increased Grades), Audio Transcriptions (Enhanced Comprehension, Student Productivity)

Accommodations

Some institutions lack equitable access to assistive technology due to high equipment cost, lack of funding, inadequate information, or limited ongoing faculty support.

Accommodations directly affect students' abilities to demonstrate subject matter proficiency.[10] They help ameliorate some effects of personal characteristics that limit access to critical information or prevent demonstrations of true abilities.[11] Universally designed instructional tools allow all students to explore and discover freely, and provide opportunities for different forms of expression.

A synthesis of learner-centered pedagogy and disability accommodations create an inclusive, effective environment for everyone regardless of impaired mobility, speech, or vision. The reported accommodations enhance class interaction and are beneficial for the typical learner.

Learner-Centered Pedagogy

A learner-centered pedagogy encourages innovative teaching, proper execution of knowledge, and the continuous growth of students. The classroom ambiance entails mutual respect. The instructor connects content in ways that inspire learning, positive attitudes, and confidence.

Student cognition and knowledge are central. The pedagogy promotes long-term retention. The teaching strategy includes *active*, *cooperative*, and *inductive* learning methods. Students are expected to think critically by **remembering**, **understanding**, **applying**, **analyzing**, **evaluating**, and **creating knowledge.**[2] Students' cognitive skills are categorized to manifest a greater variety of approaches to understanding the course content. Most students are challenged to process course material in many different ways.

The pedagogy appeals to six learner types: creative thinkers, reflective learners, team workers, self-managers, effective participator, and independent enquirers.[7]

- **Creative thinkers** imagine, create abstract ideas, and offer inventive connections to course material.
- **Reflective thinkers** invite new ideas that connect to their current knowledge.
- **Team workers** adapt well in various contexts.
- **Self-managers** show a strong commitment to learning.
- **Effective participators** actively engage issues that impact themselves and others.
- **Independent enquirers** usually recognize difference, process information, and evaluate investigations effectively.

Future Direction

- Faculty may adopt new teaching strategies.

- Using accommodations consistently can encourage flexible but sustainable changes in instruction that make learning more accessible without singling out students with disabilities.[8]

- Educators may consider that students must have multiple ways to accomplish a goal or learn a skill. If they choose a variety of materials that cater to visual, tactile, and auditory needs, these tools may encourage students' autonomy.[14]

- Encourage faculty to think critically about misunderstandings of fundamental issues regarding accommodations and their willingness to adjust their course designs.

- These findings echo the demand for educational tools that are user friendly.
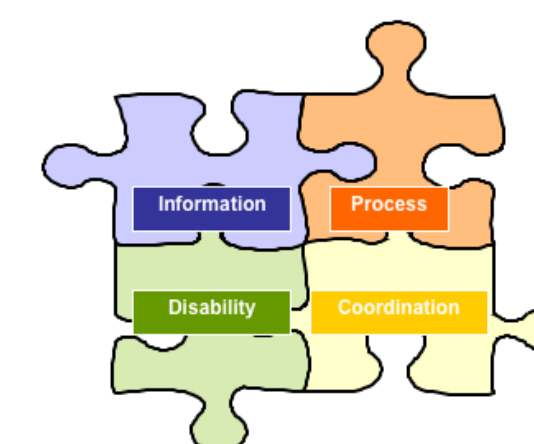
References

1 Alper, S., & S. Raharinirina. (2006). "Assistive Technology for Individuals with Disabilities: A Review and Synthesis of the Literature." *Journal of Special Education Technology*, 21(2), 47-81.
2 Anderson, L. W., and D. Krathwohl. (2001). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives.* (Complete Edition). New York: Addison Wesley Longman.
3 Burgstahler, S. (2001). "A Collaborative Model to Promote Career Success for Students with Disabilities." *Journal of Vocational Rehabilitation*, 16(3/4), 209-215.
4 Case, D., & R. C. Davidson. (2011). "Accessible Online Learning." *New Directions For Student Services*, 134, 47-58.
5 Clark, G. (2007). "Going Beyond our Limits: Issues for Able and Disabled Students." *Journal of Geography in Higher Education*, 31(1), 211-218.
6 Cook, L., P. D. Rumrill, & M. Tankersley. (2009). "Priorities and Understanding of Faculty Members regarding College Students with Disabilities." *International Journal of Teaching And Learning in Higher Education*, 21(1), 84-96.
7 Grout, H., & G. Long. (2009). "6 Teaching Cross-Curriculum Aspects within Physical Education." P. 128-145 in *Improving Teaching and Learning in Physical Education*, New York: McGraw Hill.
8 Harrison, E. G. (2006). "Working with Faculty toward Universally Designed Instruction: The Process of Dynamic Course Design." *Journal of Postsecondary Education And Disability*, 19(2), 152-162.
9 Harpe, S., & L. Phipps. (2008). "Evaluating Student Perceptions of a Learner-Centered Drug Literature Evaluation Course." *American Journal of Pharmaceutical Education*, 72(6), 135.
10 Ketterlin-Geller, L. R., E. M. Jamgochian, N. J. Nelson-Walker, & J. P. Geller. (2012). "Disentangling Mathematics Target and Access Skills: Implications for Accommodation Assignment Practices." *Learning Disabilities Research & Practice*, 27(4), 178-188.
11 Ketterlin-Geller, L. R., J. Alonzo, J., Braun-Monegan, & G. Tindal. (2007). "Recommendations for Accommodations." *Remedial & Special Education*, 28(4), 194-206.
12 Rashid, M., & U. Elahi. (2012). "Use of Educational Technology in Promoting Distance Education." *Turkish Online Journal of Distance Education*, 13(1), 79-86.
13 Shu-Chiao, T. (2012). "Integration of Multimedia Courseware into ESP Instruction for Technological Purposes in Higher Technical Education." *Journal of Educational Technology & Society*, 15(2), 50-61.
14 Stockall, N. S., L. Dennis, & M. Miller. (2012). "Right From the Start." *Teaching Exceptional Children*, 45(1), 10-17.
15 Tandy, C., & M. Meacham. (2009). "Removing the Barriers for Students with Disabilities: Accessible Online and Web-Enhanced Courses." *Journal of Teaching In Social Work*, 29(3), 313-328.
16 Van der Westhuizen, C. P., B. W. Richter, & C. Nel. (2010). "A Framework for the Integration of DVD Technology in Geography Teaching and Learning." *Journal of Geography in Higher Education*, 34(4), 561-580.
17 Wright, G. (2011). "Student-Centered Learning in Higher Education." *International Journal of Teaching & Learning in Higher Education*, 23(1), 92-97.