Where Did The Notes Go? Understanding The Learning That Motivate The Documentation Cycle As An Effective Practice For Knowledge Acquisition

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Introduction

STEM disciplines and higher education are moving towards active learning strategies that require students to engage in knowledge acquisition and knowledge transfer (Arce et al., 2015).Traditional learning environments encourage notetaking to document conceptual understanding. However, such supporting tools to solidify knowledge acquisition in active-based learning are less integrated into higher education (Rawlings, Allen, & Arce, 2005). The purpose of this study is to explore the existing literature to learn about effective notetaking strategies for active learning environments in STEM and identify the gaps where innovative notetaking strategies might become relevant.

Coverage

Criteria 1: Published in the Last Five Years
- Most recent discoveries in the field
- Built on prior research

Criteria 2: Verified Databases
- Google Scholar
- Tennessee Tech's Library database

Criteria 3: Reflect Postsecondary Context
- Interdisciplinary context
- Active learning in notetaking

Criteria 4: Peer-Reviewed Articles
- Scholarly, scientific inquiry and research method
- Accurate, credible, and current

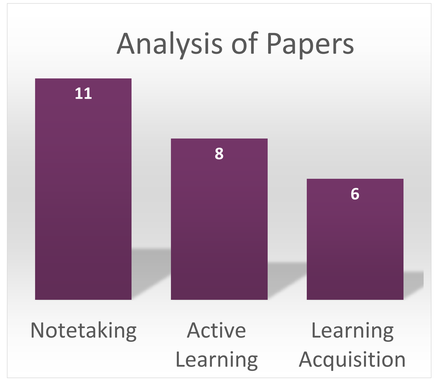
Criteria 5: In STEM, Education, or Psychology
- Actuarial and applied sciences need hands on activities
- Education and Psychology define how and why teaching techniques work

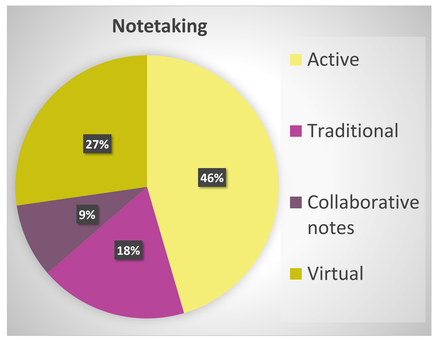
Methods

Primary Search Term	Secondary Search Term
STEM	Knowledge Acquisition
Psychology	Notetaking
Postsecondary Education	Documentation Cycle
	Active Learning
	Student-Centered Learning
	Student Cognitive Development

Results

Notetaking
- Notetaking styles have not been extensively researched due to complexity
- Complexity has prevented the training for notetaking
- Lack of awareness of the importance of notetaking for successful learning





Active:
- Lack of training results in modified notetaking strategies and years of mastery
- Active notetaking strategies increase depth of understanding

Traditional:
- Student acts as a recorder which results in fragmented information
- Information retention is limited by lack of interpretation and additional processing of the information

Collaborative:
- Bridges relations between students to allow for more in-depth learning in course content
- Peers co-construct knowledge in a rich student-centered environment leading to student integration in own learning
- Lack of systematic methods to foster collaborative notetaking

Virtual:
- Technological devices have increased as tools for notetaking
- There is a need to leverage these tools to enhance learning
- Inappropriate technological use can hinder learning

Significance

- Gap exists in notetaking strategies
  - Students and teachers need to incorporate new approaches to enhance the role of notetaking in student learning
- Integration of active and collaborative notetaking
  - Active and collaborative notetaking require student engagement in information reprocessing
- Active and inquiry-guided learning strategies
  - Literature shows increasing use of these learning methods in classrooms
  - Alignment of these learning methods with notetaking strategies is necessary

Conclusions

❖ Notetaking is divided into 4 strategies:
- Active strategies include methods of reprocessing information
  - Limited student reprocessing of information leads to shorter retention time
- Traditional strategies includes copying exactly what the professor writes and does
  - Student information is fragmented
- Collaborative strategies include methods students engage with partners in notetaking and reprocessing
  - The approach leads to a higher understanding
  - Not systematically implemented
- Virtual notes utilize notes online on items such as computers and iPads
  - Inappropriate implementation can hinder learning

Future Directions

Classroom activity and notetaking
- There is a gap between the approaches used in classroom and those used in notetaking
- Students often engage in active and inquiry-based learning in classrooms, however do not utilize active and collaborative strategies
- With the increase of technology in the classroom setting, there is a need for integration of virtual notetaking strategies

Personal Class Binder
- A systematic method of developing and training students in using active and collaborative notetaking strategies needs to be captured in a new form of notebooks, textbooks, etc that reflects personal learning

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