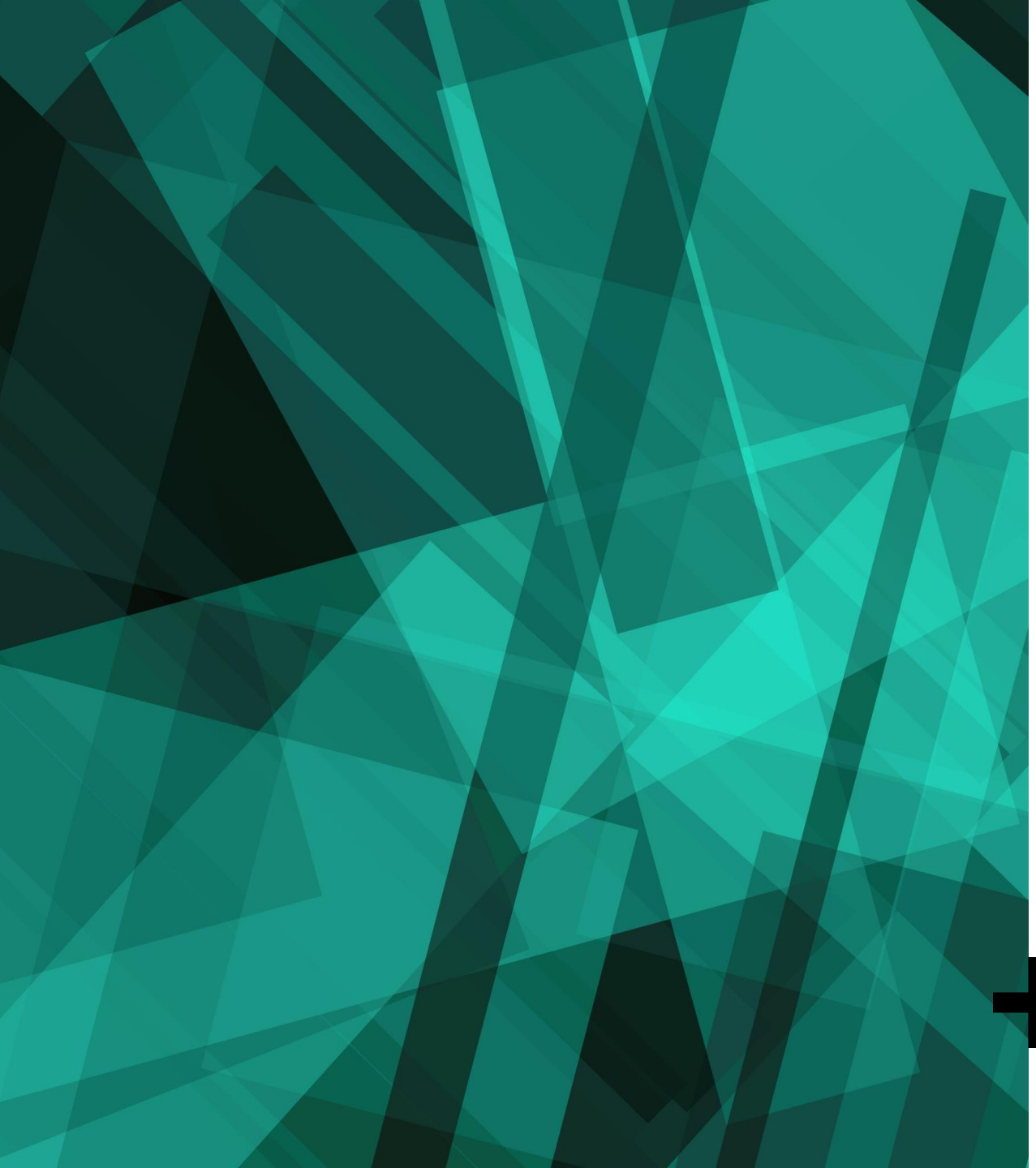

Computer Science as Discipline

Individual Task #1

1. Peters, A. (2018). Students’ Experience of Participation in A Discipline

– **Study Focus:** Longitudinal study on computer science (CS) and IT engineering students' experiences of discipline participation.

Key Findings:

- **Evolution of Identity:** Students' perceptions of their own identity and belonging within the discipline evolve over time.
- **Participation:** Participation is influenced by both personal and external factors, including experiences in courses and interactions with peers and faculty.
- **Challenges:** Early challenges can affect students' long-term engagement and retention in the discipline.
- **Educational Implications:** Insights from the study suggest the need for supportive structures to enhance student participation and retention.

2. Peters et al. (2014). First Year Computer Science and IT Students' Experience of Participation in the Discipline

- **Study Focus:** Experiences of first-year CS and IT students regarding their participation in the discipline.

Key Findings:

- **Initial Experiences:** First-year experiences significantly shape students' perceptions and engagement.
- **Engagement Factors:** Factors such as course content, teaching methods, and peer interactions play a crucial role in student engagement.
- **Identity Development:** Early experiences contribute to the development of students' professional identity in the field.
- **Recommendations:** The study suggests improving initial experiences to better support student engagement and identity formation.

3. Proctor et al. (2019). Defining and Designing Computer Science Education in a K12 Public School District

– **Study Focus:** Design and definition of CS education in K-12 public schools.

Key Findings:

- **Curriculum Design:** Effective CS education requires thoughtful curriculum design that aligns with educational standards and student needs.
- **Professional Development:** Teacher training is critical for successful implementation of CS education.
- **Equity and Access:** Ensuring equitable access to CS education across diverse student populations is essential.
- **Recommendations:** The study emphasizes the need for clear goals and continuous assessment in designing CS programs.

4. Garner, Denny, & Luxton-Reilly (2019). Mastery Learning in Computer Science Education

– **Study Focus:** Application of mastery learning principles in CS education.

Key Findings:

- **Mastery Learning:** Mastery learning, where students achieve proficiency before moving on, can improve learning outcomes in CS education.
- **Implementation:** The study discusses strategies for implementing mastery learning, including formative assessments and feedback.
- **Benefits:** Mastery learning helps in addressing gaps in understanding and supports personalized learning paths.

5. Graham, Knuth, & Patashnik (1991). Concrete Mathematics - A Foundation for Computer Science

– **Book Focus:** Provides foundational mathematics essential for CS.

Key Topics:

- **Mathematical Foundations:** Covers discrete mathematics, combinatorics, and number theory crucial for CS concepts.
- **Application:** Emphasizes the application of mathematical principles in algorithm design and problem-solving.
- **Pedagogical Approach:** Integrates theory with practical examples to enhance understanding.

5 Computing Disciplines and Majors

6. Courte & Bishop-Clark (2009). Do Students Differentiate Between Computing Disciplines?

- **Study Focus:** Investigates whether students differentiate between various computing disciplines.

Key Findings:

- **Discipline Awareness:** Students often lack clear distinctions between computing disciplines, affecting their academic and career choices.
- **Educational Impact:** Increased awareness and clearer delineation of disciplines can help students make more informed decisions.

7. Gokhale (2014). Online Learning Communities Prove Effective in Recruiting Students into Computing Majors

- **Study Focus:** Effectiveness of online learning communities in recruiting students into computing majors.

Key Findings:

- **Recruitment:** Online communities can successfully engage and recruit students into computing fields.
- **Community Benefits:** Provides support, resources, and a sense of belonging, which can enhance student recruitment and retention.

8. Pokorny (2009). Introduction to Computing: A Fresh Breadth of Disciplines

– **Study Focus:** Explores the breadth of disciplines within computing.

Key Findings:

- **Diverse Disciplines:** Highlights the various subfields within computing and their applications.
- **Curriculum Design:** Advocates for a broad-based introductory curriculum to expose students to different computing areas.

9. Meiselwitz (2008). Information Security Across Disciplines

Study Focus: Information security from an interdisciplinary perspective.

Key Findings:

- **Interdisciplinary Approach:** Effective information security education benefits from incorporating perspectives from various disciplines.
- **Curriculum Development:** Suggests integrating security topics into broader computing curricula to enhance relevance and application.

10. Koffman et al. (2007). New Paradigms for Introductory Computing Courses

– **Study Focus:** Innovative approaches to introductory computing courses.

Key Findings:

- **New Paradigms:** Discusses new teaching paradigms and methodologies for improving introductory computing courses.
- **Course Design:** Emphasizes the need for engaging and relevant course content to better prepare students for advanced study.

Analysis of Computer Science as a Discipline and the 5 Computing Disciplines and Majors

- Computer science is all about studying computers, how they work, and the ideas behind them. Research in this area helps us figure out how to teach computer science better and how students learn from it. Peters (2018) found that how much students get involved can affect their future studies and careers. Early experiences, as shown by Peters et al. (2014), are really important because they impact students' success and interest in the field over time.
- Creating good computer science education is key to helping students succeed. Proctor, Bigman, and Blikstein (2019) highlight the need for good curriculum and teaching methods in schools to introduce computer science concepts effectively. Garner, Denny, and Luxton-Reilly (2019) recommend using mastery learning, where students need to fully understand a topic before moving on, to improve learning and retention. These methods help build a strong foundation and keep students engaged.
- It's also important to understand the different areas within computing. Courte and Bishop-Clark (2009) look at how students view fields like software engineering and computer science. Gokhale (2014) shows that online communities can attract students to computing majors by offering support and interaction. Books like "Concrete Mathematics" by Graham, Knuth, and Patashnik (1991) provide the essential math knowledge needed for computer science. Overall, research into how students experience learning, how curriculums are designed, and what resources are available shows that we need to keep improving computer science education to better support students.
- Looking to the future, it's clear that computer science education needs to keep up with changing technology and industry needs. Curricula must adapt to include new topics and skills. Ongoing research and feedback from students and teachers can help guide these updates, making sure computer science programs stay relevant and effective. By adapting to these changes, schools can better prepare students for future challenges and opportunities in the field.

Getting To Know You:

I'm Keith Gerald S. Alunan. My friends call me Keith. I live in Lawaan I, Talisay City, Cebu. My hobbies involve reading, playing games, and gardening. I graduated from CIT – U with an ABM track and last but not least, I chose University of San Carlos in view of the fact that the school has a lot to offer after you graduate and as to why I chose BSIT, it is mainly because I've always love technology.

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