The Self-Directed Disposition: What Computing Students Say

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What Students Said: Being Self-Directed

I **set clear goals or when to do each problem** to get them done in a reasonable time, and time at the end to go over the assignment to make sure nothing needs to be changed before submitting it

Being self-directed is, imo, the most valuable tenant of being a software developer. In my prolog homework, I would often **come upon areas that I was weak in**. It was diving deeper into the course materials to find solutions through material I had not yet grasped mentally.

I had to be self directed in the design of this project, as there are many ways to make the UI in Java Android. A lot of the process was **trying out different formats** for the game and how to streamline it.

I **looked through documentation** to find methods that I thought were most applicable to my project instead of only using methods we learned in class.

What Students Said: Factors for Not

I do not believe I was very self-directed when completing this assignment because **all the techniques I used where taught to me during class**. I did not have to go out of my way to learn anything new to complete this.

I was no too much self-directed on this assignment because **we did many of this type of assignments before so**, it was pretty consistent and easy.

I felt like I couldn't be self-directed during this project. This isn't really due to the professor saying that we couldn't, it's just because **I didn't know what to do** and I had no idea how to solve the problems presented.

Again, **low motivation so I'm not super self-directed** and I often don't know what I'm doing

Agenda

- Why Dispositions?
- Self-Directed
- Research Questions
- Context, Methods, and Analysis
- Results
- Discussion

Desirable for the workplace

Human aspect of learning, individual behavior in professional development

Knowledge

Know - what

+

Skills

Know - how

+

Disposition

Know - why and know - yourself; “intent and willingness to apply knowledge and skills in a given context”

= Competency

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CC2020

Study Focus: Self-Directed Disposition

Element	Elaboration	Element	Elaboration
Adaptable	Flexible; agile, adjust in response to change	Professional:	Professionalism, discretion, ethical, astute
Collaborative:	Team player, willing to work with others	Purpose-driven:	Goal driven, achieve goals, business acumen
Inventive:	Exploratory. Look beyond simple solutions	Responsible:	Use judgment, discretion, act appropriately
Meticulous:	Attentive to detail; thoroughness, accurate	Responsive:	Respectful; react quickly and positively
Passionate:	Conviction, strong commitment, compelling	Self-directed:	Self-motivated, determination, independent
Proactive:	With initiative, self-starter, independent		

From CC2020: Table 4.4 on page 51

Even though dispositions are included in the curriculum report, few studies exist about developing dispositions in computing students.

The Research Team:
Invited community to collect data, analyzed data, discussed results





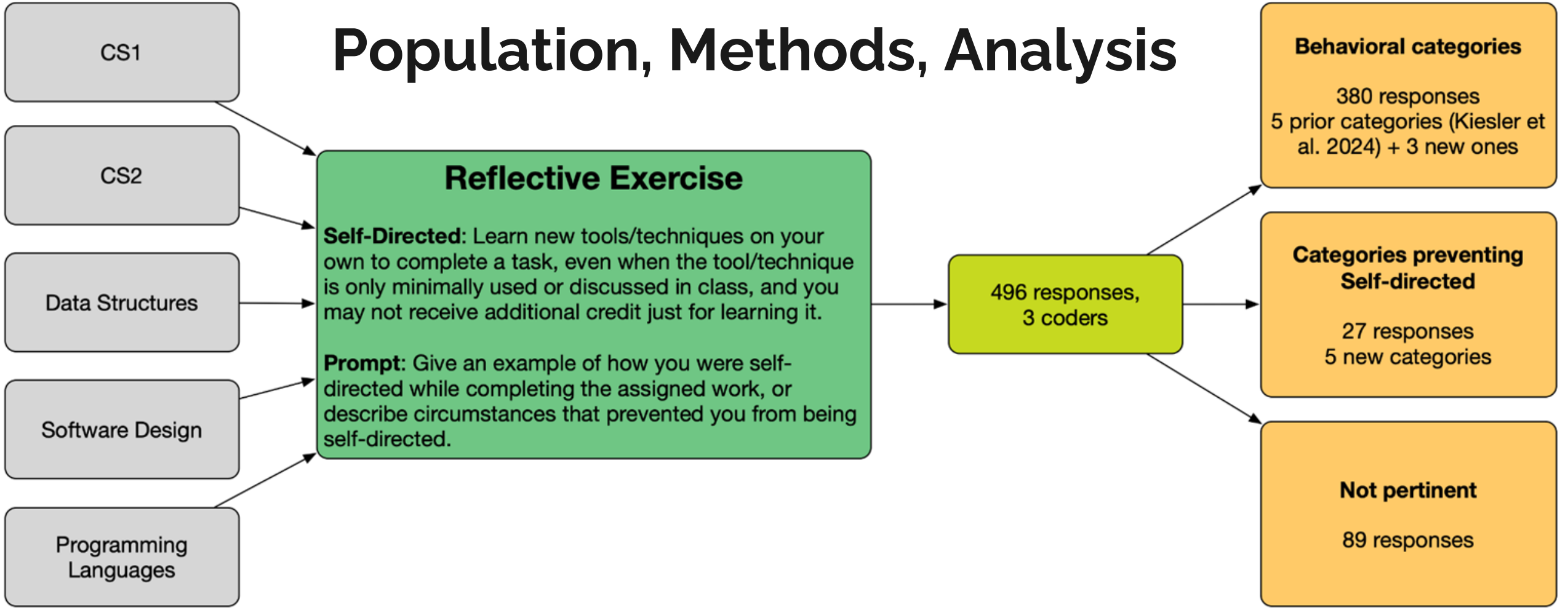

RQ1: What do students **describe** as their self-directed practices in computing?

RQ2: What do students report are **factors that prevent** them from being self-directed?

Table 1: Course sections, participants, and student responses in this study

Course	CS1	CS2	Data Struct.	Soft Design	Prog. Lang.	Total
Sections	9	1	1	2	5	18
Participants	151	10	4	18	81	264
Responses	307	23	4	35	127	496

Population, Methods, Analysis



Results: Behavioral Categories

Table 2: Behavioral categories for *self-directed*

Name	Definition
Utilizing external resources (148)	Selecting additional material or reaching out to people to support one's own learning
Learning necessary material (70)	Demonstrating a process to learn new material, including concepts, tools, techniques
Working independently (55)	Doing the problem or task without assistance from others
Assessing oneself (39)	Recognizing one's own capabilities, deficits, or lack of expertise, and appropriateness of learning strategies
Planning ahead (23)	Planning actions before execution, either in terms of time or designing sub-steps
Applying useful techniques (23)	Applying techniques that are helpful with learning and doing the work
Completing the assigned work (19)	Achieving the goal of completing the work
Reviewing against expectations (3)	Reviewing one's own actions and outcomes against provided expectations, guidelines, or goals

Results: Factors Preventing

Table 3: Self-reported factors for not being *self-directed*

Name	Definition
Assignment structure (12)	To the student, the assignment structure does not need the disposition to be applied or entirely doesn't allow it
Unsuccessful effort (7)	The student tried, but could not successfully apply the disposition (e.g., due to lack of understanding or getting stuck on a problem)
Self-sufficiency (4)	Given their own skills, student believes that they do not need to apply the disposition
Insufficient motivation (3)	The student is not motivated to apply the disposition or to participate in the course.
Insufficient time (1)	A lack of time prevented them from succesfully applying the disposition

Discussion: Interpretation

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Discussion: Implications for Educators

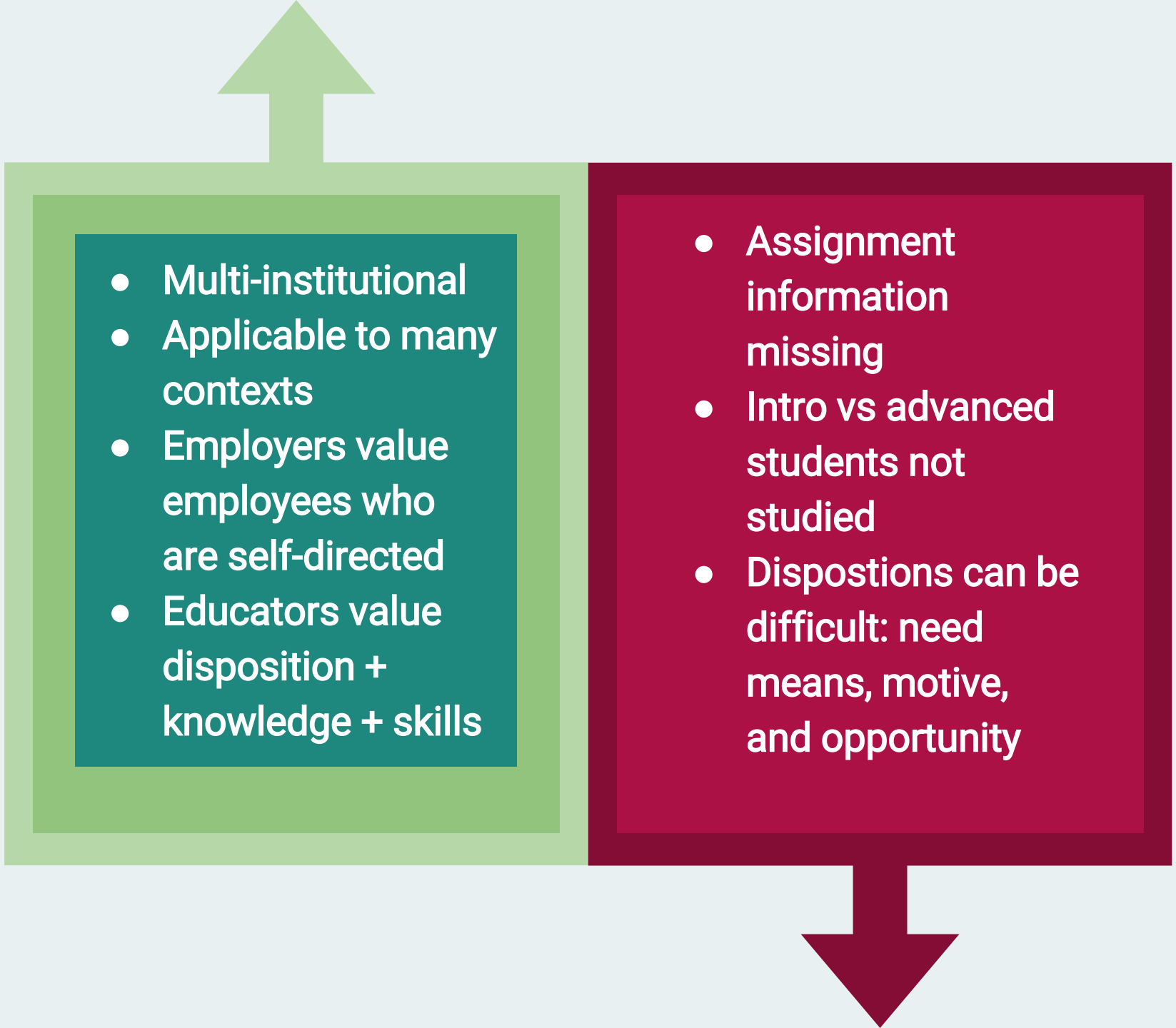
Scaffolding Assignments

Student Motivation

Projects

Internships & Workforce

Conclusions



Thank you

Do you have thoughts, ideas, questions?

https://dispositions-project.org

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Extra Slides

Methods

Population: Collected data from students at several institutions from five courses

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Reflective exercises embedded into courses

Presented definition: Learn new tools/techniques on your own to complete a task, even when the tool/technique is only minimally used or discussed in class, and you may not receive additional credit just for learning it.

Prompt: Give an example of how you were self-directed while completing the assigned work, or describe circumstances that prevented you from being self-directed.

Data and Analysis (part 1)

Data unit: single response to prompt

Total units analyzed: 496 responses

How? Each response was identified as "exhibited self-directed behavior", "did not apply self-directed disposition", and "not pertinent"

Behaviors: Qualitative data analysis with five deductive categories for behaviors of self-directed based on prior study [*Kiesler et al.*]

[N=380]

New categories emerged

Three researchers analyzed all responses as new categories emerged

Data and Analysis (part 2)

Not applied: Qualitative data analysis with inductive categories for factors that prohibited students from being self-directed

[N=27]

Three researchers analyzed all responses as new categories emerged

Not pertinent: These responses were not studied further

[N=89]