

## Vision Paper: Future Technology to Preserve College Student Health and Foster Wellbeing

### *Finding the Release Valves in the Pressure Cooker of Campus Life*

Promotion of college student health and wellbeing is a complex endeavor that has received increasing attention from many stakeholders. Three primary challenges are evident when examining the current state of college student health. The challenges identified herein focus on assessment of health behaviors, defining the predictive components in the campus ecosystem, and allowing for radical and disruptive change to occur to impact the system. Our current technologies afford us the capability of making a variety of changes to the higher education system in a way that has not been done in decades to positively impact the health and wellbeing of students and the time to leverage them is now.

**Challenge #1: To fully characterize health behaviors in the college student population and the extent to which they cause and/or impact mental health, maladaptive coping, and academic performance.**

Health and wellbeing have now been identified as a significant problem, yet institutions have been struggling with what to do about it. This may be in part due to the lack of assessment and monitoring of all facets of health behaviors and self-care in the student population. Some campuses may measure some aspects of health and wellbeing, but often use burdensome self-report over objective or passive measures. While some have made attempts to passively monitor college students, it's often done on the level of the student, ignoring any potential impact of the status of the staff, administration, and faculty. Certainly, there may also be hesitancy in assessment due to the lack of resources to do anything about addressing problems identified. While full multidimensional assessments of the health of the population may be the first step to provide more information about the outcomes of interest, what it will fail to do is to fully define causes of and contributors to the undesired outcomes. A systematic expansion of sensing and examination of the system and its impact on health and wellbeing of all its members is needed.

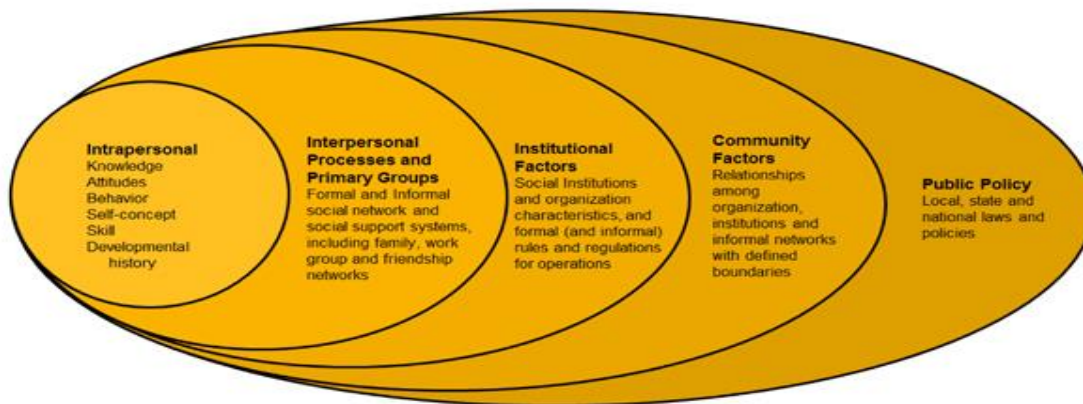


Figure 1: The Ecological Model of College Student Health

**Challenge #2: To exploit all available data to fully examine the college campus ecosystem and how its features predict college student health and wellbeing**

The college campus is unique in that it provides an insular community with many stakeholders that could be studied and exploited. Campuses can leverage the vast amount of information collected on a day to day basis and yet, few are putting the pieces together to create an in the moment and dynamic picture of the pulse of the campus. Similar to other community based approaches to health problems, one initiative, Healthy Campus 2020, has attempted to take an ecological approach to addressing college student health. However it does not get widespread use and could take greater leaps if it leveraged the

full capabilities of technology available on college campuses. Specifically, an ecological model could be used to not only assess the campus, but also to intervene on it. Using the ecological model to its fullest extent to assessing the college campus can fully identify, define, and predict problems at all levels. Using Northwestern University as an example, Figure 2 illustrates many data streams available. If all streams of available data were considered, a fuller and richer picture of the dynamic context within the bubble of the college campus would develop providing guidance as to the true needs of the system.

Ecological Model Component	Target	Type of data	Data source (if known)
COMMUNITY	Schedules	Class schedules	Academic Calendar
		Cycles	
		Exam and Break times	
	Facilities	Content of rooms/spaces	Facilities Management System
		Use frequency, duration, timing	NUIT (wifi)
	Vendors	Services available	NU Vending/Financials
Use of services			
Cost of services			
INSTITUTIONAL	Financial	Costs and Expenses	NU Financials / OSR
		Cycles of funding/reporting	
	Admissions	Enrollment	Admissions Database and Canvas
		College and class enrollment	
INTERPERSONAL	Social media	Use	NU Accounts
		Content	
	Interaction	Proximity of individuals	NUIT (wifi)
	Campus Events	Scheduling	Planet Purple and NUIT
		Attendance	
INTRAPERSONAL	Staff behaviors, attitudes, and health	Movement on Campus	NUIT, Wildcard, wifi, Canvas, other passive phone level or wireless sensors
	Faculty behaviors, attitudes, and health	Use of services	
	Student behaviors, attitudes, and health	Absences Performance Internet Use	

Figure 2: Potential data streams to predict health and wellbeing on a college campus

**Challenge #3: To exploit new knowledge and technological tools in a way that disrupts the ecosystem and changes the culture of health to one that values wellbeing that boosts performance.**

Analyzing these data streams as a whole over the course of time could provide valuable insight and action to change the trajectory of an outcome of interest. Technology has not been exploited or leveraged at the pace that it has developed. Through the full use of current technologies, exploration of all available data, and development of contemporary models of higher education, the time is right for large disruptive change to occur. One could also imagine how the terrain of attaining a college degree could drastically change, for the better. For example, there may be no real reason for students to have to endure taking 5 finals in a week if technology afforded more flexibility in content delivery and assessment. Changes in delivery of education could be made to alleviate time, cost, and pressure on students, faculty, and administration. The overall result might positively impact all levels of the college community, but the end result of most interest would be to create value in wellbeing and balance that has potential to lead to higher performing, healthier, happier college student population.

*Dr. Angela Pfammatter is a Licensed Clinical Health Psychologist and a Postdoctoral Fellow in the Department of Preventive Medicine at Northwestern University Feinberg School of Medicine. She has wide range of interests centered around exploring the optimization of health behavior change, primarily through the use of technology, to treat and prevent chronic conditions such as obesity, cardiovascular disease, and diabetes*