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Elements of Early Warning Systems: Identifying Students Who Need Support Early Enough to Change Their Trajectory Towards Graduation

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Elements of Early Warning Systems: Identifying Students Who Need Support Early Enough to
Change Their Trajectory Towards Graduation

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GRAND VALLEY STATE UNIVERSITY

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The signatures of the individuals below indicate that they have read and approved the project of Samantha Mayse in partial fulfillment of the requirements for the degree of Master of Arts in Social Innovation.

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Abstract

Student success initiatives have been a focus at many institutions of higher education to help with retention rates but identifying the students who need the student success resources most can be challenging. Scholarships increase access to higher education but do not necessarily contribute to student success. Thus, this research project sought to analyze early alert systems used by mid-sized universities in the U.S. Midwest to help similar institutions in developing their own early alert system. Using mixed methods, this study included a qualitative analysis of institution's policies and procedures for early warning systems and a quantitative analysis of GVSU institutional data about retention and academic performance of students within a scholarship program. Through inductive coding, 12 early alert systems were analyzed to determine that the ideal early alert system is one that provides the most holistic picture of a student. Early alert systems need to use data from learning management systems to provide real-time feedback about a student's academic performance. However, the systems also need to account for other factors that can hinder academic success, like health emergencies and food and housing insecurity.

Table of Contents

Introduction.....	5
Research Question	8
Literature Review.....	9
Student Integration.....	9
Student Attrition.....	11
Theory of Planned Behavior	12
Research Gaps and Limitations	13
Literature Review Conclusion	17
Study Design.....	18
Data Collection Methods	19
Data Analysis	20
Findings.....	22
Limitations, Institutional Data Recommendations, and Future Research.....	27
Conclusion	29
Works Cited	31
Appendices	
Appendix A: IRB Determination Letter	34
Appendix B: Starting Sample Pool of Universities	35
Appendix C: Email Script.....	36

Introduction

The cost of higher education has increased year over year. When comparing the average cost of tuition and fees and room and board, using 2018-2019 dollars, college costs have increased 169 percent between 1980 and 2019 (Hess, 2021). As costs increase, it becomes even more imperative for students to graduate and to graduate on time. College students who used loans to pay for tuition but never graduated struggle to repay their loans as they lack the degree needed to get better paying jobs (Barshay, 2017). A 2010 study by Hayes calculated the estimated average economic cost of delaying graduation by one year to be between \$94,921 and \$114,549 over the cost of that person's lifetime (p. 134). This includes the extra cost of tuition, lost salary, and even lost retirement contributions by not joining the workforce on time.

Colleges and universities also benefit when students graduate. Institutions often have limited resources to recruit and retain students (Demeter et al., 2021; Xu & Webber, 2018). Many universities and colleges use their limited funds to provide identity-specific centers to promote student retention and belonging, like LGBTQ centers or multicultural centers. Institutions also invest in faculty and advisors to mentor students on their academic and professional goals. Summer bridge programs are offered to help students transition from high school to college. Given the limited resources available, but also the importance in investing in retention initiatives, institutions seek more effective and efficient ways of delivering services to those who will benefit most from them. Retaining students provides a steady stream of income for institutions through tuition and fees (Burke, 2019, p. 13). In contrast, lost revenue from students who decide to drop out costs an average of \$16.5 billion across U.S. higher education institutions each year (Hanson, 2021).

Scholarships are an important retention tool in higher education. By reducing the cost to attend, scholarships allow students to focus more on their studies and less on how to pay for their education (Zacharias & Ryan, 2021, p. 155). In other words, students have more time to devote to their coursework because of scholarships, which contributes to academic success. However, scholarships alone do not provide the tools needed to be successful. A 2015 study by Farenga showed that scholarships provided financial support but did not necessarily contribute to students' academic success (p. 70). The best scholarship programs couple financial assistance with student success programs as illustrated in research by Byrne and Cushing, which showed that students had higher retention rates when their scholarship embedded student support services into the program (2015, p. 54-56). Unfortunately, not all students take advantage of the student success opportunities available, even when they are integrated into a scholarship program.

There has been lots of research into student persistence, dropout, and retention in hopes of improving retention and graduation rates. Nevertheless, nearly one-third of all freshmen in college in the United States do not return for their second year (Hanson, 2021). Six years after starting college, only 62 percent of all U.S. college students have graduated (Nietzel, 2022), and only one third of students who drop out return to finish their degree (Hanson, 2021). As mentioned earlier, delaying graduation reduces students' earning potential, and dropping out further exacerbates the earning gap between workers with college degrees and those without. On average, college graduates earn \$21,000 more per year than those who drop out (Hanson, 2021). College dropouts are also four times more likely to default on their student loans. This has a tremendous impact on everyone as taxpayers pick up the costs of defaulting, which is forecasted to be \$31 billion over the next 10 years (Hanson, 2021). Given the impacts of student departure on students, institutions, and the community, what can universities do to identify

underperforming students early enough to intervene and help students persist through graduation? Early warning systems that alert student success coaches of a student who is likely to underperform and is on the path to withdrawing from postsecondary education could be a solution.

Research Question

What is the most effective early warning system to use in identifying underperforming students in a specific scholarship program? An effective early warning system would be one that accurately identifies students who are likely to be placed on academic probation, removed, or withdraw from the university without attaining a certificate or degree. In addition, the students need to be identified early enough to provide student success resources to change their trajectory toward degree completion.

Literature Review

Addressing student departure from their university education is difficult because each student's experience is unique. They have varying family backgrounds, educational opportunities, and expectations of college life. Student departure also occurs in different ways, from academic dismissal initiated by the university to voluntary student withdrawal. Students may decide that their current institution is not right for them and decide to attend somewhere else. Maybe the culture is not what they want or maybe a different college or university has a better program or a completely different program of interest. Students can also decide to stop-out, choosing to take a temporary leave of absence. Finally, students might decide to drop out completely from postsecondary education. Given that each student's experience is likely to be distinctly their own, a review of the theoretical frameworks on student persistence and attrition is important in comprehending why students leave and in predicting which students are more likely than others to persist.

Student Integration

To better understand student departure, Tinto developed what has been called the "student integration theory of retention" (Dewberry & Jackson, 2018, p. 101). This theoretical framework for predicting dropout is based on Emil Durkheim's theory of suicide (1975, p. 92). According to Durkheim, one's decision to commit suicide includes one's individual characteristics, predispositions to suicide, and social status, among other things (Durkheim, as summarized in Tinto, 1975, p. 93). Tinto applied this framework to student dropout decisions, suggesting that students' individual attributes impact their ability to integrate into college society, and those that fail to integrate academically and socially will drop out (1975).

Numerous studies used Tinto's sociological model as the theoretical framework for their own research. After controlling for several entering characteristics, Pascarella and Terenzini (1979) found that the academic integration variables that explain dropout include freshman grade point average; academic and intellectual development; faculty concern for teaching and student development; and informal contacts with faculty to obtain information about courses and academic progress, discuss career concerns, and discuss intellectual matters (p. 204). Important social integration variables included extracurricular activities; peer-group relations; informal relations with faculty; and informal contacts with faculty to help resolve a personal problem, discuss a campus issue, and socialize informally. Woosley and Shepler (2011) found that involvement and campus environment contribute to social integration while academic integration is affected by commitment, campus environment, and basic academic behaviors (p. 707-708).

More recent research on college persistence has looked at improving Tinto's model. Ishitani expanded on Tinto's model using event history modeling with period-specific effects to see how the significance of variables differed from year to year and found that first-generation students are more likely to drop out during their second year of college (2016, p. 27-28). Another study, using event history modeling, looked at the effects of classroom diversity on students' decisions to drop out and learned that students of color and first-generation students were less likely to drop out when they had greater exposure to students of color (Herzog, 2022). However, this same study also found that academic measures provided a more consistent explanation for student withdrawal, with lower academic performance being positively correlated with withdrawal. Completing an additional 3-credit course each semester, a one-letter grade rise in grade point average, and a student visiting the advising center once a semester all lowered one's

risk of dropping out. Taking steps to academically perform well and complete degree requirements suggests that a student is engaged and wants to persist.

Academic success is not the only factor when it comes to persistence. Revising Tinto's model to include financial information, Xu and Webber discovered that financial pressure was the most cited reason impacting retention (2018, p. 21). If a student doesn't have the money to pay for tuition and/or living expenses, the academic success may not matter. The student's financial situation forces them to withdraw completely. Xu and Webber further found that academic integration was more important for White students, while social integration was more important for Black students. This correlation suggests that the factors impacting students' decisions to persist or drop out are different between White students and Black students, and thus, the resources these students need are also different. Student responses also showed that institutions play an important role in increasing student retention, although how exactly may differ between White and Black students (2018, p. 21).

Student Attrition

The work of Bean applied a different understanding of student dropout compared to Tinto. Bean compared student attrition to employee turnover, suggesting that the reasons students leave higher education is similar to the reasons why employees leave companies (1980, p. 157). Bean found that institutional commitment, institutional quality, and routinization (having a sense of a routine) were significant in explaining student attrition for women (1980, p. 167). For men, institutional commitment, routinization, satisfaction, and communication were important indicators. However, institutional commitment, or loyalty to being a member of the institution, was by far the most important factor for both women and men (p. 178). Students need

to feel welcome and valued at the institution as this grows their loyalty to it and their desire to stay.

Much of the work on student attrition has been furthered by Bean and his associates in later research (Cabrera et al., 1993, p. 123). In 1989, Bean and Vesper categorized variables into organizational, personal, and environmental factors (p. 125). They noticed that variables which were not academic in nature contributed significantly to students' decisions to persist or drop out (Cabrera et al., 1993, p. 125). These studies illustrate the importance of an institution's climate and suggest that students' decisions go beyond academic performance. To address student departure, colleges and universities need to consider how students feel about the institution itself and their place within in it.

Noticing similarities between the student integration and student attrition models, Cabrera et al. wondered what would happen if the two models were combined. They discovered that a better understanding of student persistence could be achieved when student integration and student attrition were merged (1993, p. 135). Specifically, they learned that environmental factors played a more intricate role than the student integration theory suggests. Tinto's model considered environmental factors to have a less pronounced effect on decisions to persist, but Cabrera et al. discovered that external factors like encouragement from friends and family have a big effect on a student's social and academic experiences (1993, p. 135). This means students' decisions to persist are heavily influenced by their friends and family.

Theory of Planned Behavior

Building on the importance of encouragement from friends and family in explaining student persistence, Dewberry and Jackson apply the theory of planned behavior, which suggests that a student's intent to perform a behavior affects the student's engagement in that behavior

(2018, p. 102). The theory of planned behavior combines attitudes toward behaviors, social norms concerning the behaviors, and students' beliefs that they can successfully accomplish the behaviors (self-efficacy). For example, this framework would suggest that a student who believes higher education is not for them and comes from a collectivist culture that values the family unit over individualism would be less likely to go to college or persist because the student's self-efficacy and social norms do not value higher education, whereas a student whose parents both earned a bachelor's degree would likely have social norms pushing them toward higher education.

Dewberry and Jackson designed a study to test whether student integration or the theory of planned behavior was more effective in predicting student retention. The study found that academic and social integration did not significantly predict a student's intent to drop out, while the theory of planned behavior was successful (p. 105). Roland et al. used the theory of planned behavior in a study on student attrition and showed that the beliefs others have regarding ourselves is important to how we behave, suggesting that social norms are contributing factors in the decision to persist or drop out (2018, p. 228). In other words, what a professor or a parent thinks and expects of a student, as well as the belief a student has within themselves, could contribute to whether that student decides to continue with their education or decide to drop out.

Research Gaps and Limitations

Researchers have been conducting research on student persistence, retention, and attrition for several decades, yet there are serious gaps and limitations in the research. Brunsten et al. assert that the student integration model is too vague, allowing for researchers to determine what variables are considered academic versus social and which are the right ones to include (2000, p. 305). Dewberry and Jackson agree, pointing out that Tinto revised his original theory in 1993,

adding seven more variables, while Douglas Guiffrida proposed a total of 20 in his 2006 study (2018, p. 108). In addition, Brunsten et al. argue that studies in support of Tinto often look at individual components of the model rather than studying the model as a whole (p. 306). The findings from research about the parts of the model don't necessarily extrapolate to the entire model. A student's experience is not limited to just academic or just social. These areas intermingle, so research needs to have a holistic understanding rather than a partial understanding based on the model's subparts.

Another major issue with Tinto's model is the expectation of students to integrate into the academic and social fabric of the institution. For students from populations that have been historically excluded from higher education, assimilating can feel like separating themselves from friends and family (McQueen, 2009, p. 79). Naylor and Mifsud also highlight the issue of integration in promoting equity for historically-excluded populations (2020, p. 266). Requiring students to assimilate puts the onus on the students and ignores structural inequalities that exist within the institution and within education as a whole. Assimilation allows institutions to overlook how systemic racism in practices like redlining forced Black communities and other marginalized populations into poorer neighborhoods, limiting their access to quality education, health care, food, and housing. Colleges and universities further overlook obstacles that historically-excluded populations face in being part of an institution that is mainly White, such as microaggressions or the inability to find haircare products for their particular hair types. Assimilation also perpetuates systemic ableism as colleges and universities do not adequately address mental health and overall wellbeing, as discussed later in this paper.

Instead of focusing on students' ability to assimilate, colleges and universities need to use a framework that acknowledges systemic and institutional barriers. Naylor and Mifsud argue just

that, suggesting a theory centered on structural inequality would be more effective (p. 260). This type of framework would address the explicit and implicit biases held by faculty, staff, fellow students, and the surrounding community. A framework centered on structural inequality would require institutions to tackle policies and practices that privilege the dominant culture over others, like the expectation to communicate using particular styles and ways of knowing in the classroom (valuing the written word over verbal accounts passed down generation by generation).

The student attrition model takes an organizational approach, putting the responsibility of persistence back on institutions rather than solely on students. Many of the variables included in Bean's model are functions "of the institutional structure and organization" of an institution (Burke, 2019, p. 17). Unfortunately, Bean's original research only focused on White, American citizens in an attempt to control demographics (1980, p. 161). The experiences of White citizens cannot be assumed to be the same for any other race/ethnicity or citizenship status.

A glaring gap in all of these theories is mental health. College students consider mental health a basic need, along with housing and food security (Martinez et al., 2021, p. 821). For some students, the extra stress of trying to meet basic needs affects their ability to be academically successful (Martinez et al., 2021, p. 830). Struggling to meet basic needs goes beyond a background characteristic of "low-income." For example, a student's culture might stigmatize seeking help for depression, so the student's socio-economic status might not be the main factor at play in this instance. Thus, theories on student retention need to acknowledge how imbalanced the experiences and circumstances are for some students as their hurdles to success are greater to overcome.

In addition to theoretical limitations, there appears to be a significant gap in the types of methods used. Most research focuses on quantitative methods, solely “examining administrative data” (Diehl et al., 2020, p. 420). Quantitative studies use aggregate data to generalize what is happening, drawing correlations among the data not cause and effect conclusions. Without qualitative data to share what the actual experiences are, researchers only tell part of the story at best, and a distorted one at worst. Tight acknowledges that there needs to be a larger focus on the student experience (2020, p. 697). Brunsten et al. also recognize the need to understand students’ experiences and how they come to make decisions (2000, p. 308). They suggest qualitative approaches as a means of providing strong individual accounts. Ishitani and DesJardins even suggest qualitative research as a next step to their own research, admitting that their quantitative study can only provide so much information (2002, p. 197). To better understand the correlations identified in quantitative studies, more qualitative studies are necessary.

A further concern with the methods used in most studies on retention is the use of past data and known outcomes to predict persistence and rates of future dropout decisions. Demeter et al. showed that their model did a better job of predicting outcomes each time the model added another semester worth of data (2021, p. 602). Unfortunately, new students don’t have multiple semesters of data to input into this model. Higher education institutions need a quicker way to identify students who could use additional support during their first and second semesters. Taking this research a step further, I am specifically interested in designing an early alert system that uses real-time data to notify a student success coach when a student is at-risk of dropping out so the student success coach can intervene early enough, allowing the student to alter their course toward persistence rather than continue down the path toward dropping out.

Literature Review Conclusion

Supporting students who are most at-risk of dropping out is an effective use of campus resources as the students who need the help are receiving the services. Thus, creating an early warning system to notify student success coaches of the at-risk students is key. For many decades, research into student retention, persistence, and attrition has tried to understand why students persist in education and why students drop out. The research shows that the issue of student decisions to drop out is complex and multifaceted. Academic and social integration, societal norms, self-efficacy, expectations from friends and family, institutional factors, finances, and mental health all play a role in a student's decision to earn a degree or drop out. Taking all of these variables into account provides a more holistic approach to student retention by recognizing the individuality of each student and also the structural inequalities that disadvantage certain populations.

Study Design

This study seeks to identify and analyze early warning systems used by mid-sized universities (defined in the next section) in the U.S. Midwest to help similar institutions in developing their own early warning system. These criteria were used because it is comparable to my own institution, Grand Valley State University (GVSU), making it more relatable to my professional and academic work. Using mixed methods, this study included a qualitative analysis of policies and procedures for early warning systems and a quantitative analysis of GVSU institutional data about retention and academic performance of students within a scholarship program. Prior to contacting university representatives to find out about their academic early warning systems, I completed an Institutional Review Board determination with GVSU, which concluded that my research did not meet the federal regulations for human subjects research and that I was not required to submit an IRB protocol for this study (see Appendix A).

Data Collection Methods

Using CollegeSimply's website (www.collegesimply.com), I identified all colleges and universities in the Midwest (a total of 886). I narrowed this down to 4-year public institutions with enrollment roughly between 13,000 and 33,000 students, resulting in a sample of 27 universities. The full list is provided in Appendix B. With the sample of institutions selected, I then used each university's website to try to identify the person in Academic Affairs who oversees student success initiatives or undergraduate education. For some institutions, this position was not clearly identified, so I looked for the person who oversees the institution's central academic advising center. If the university had an advising center for each college, I reviewed the organizational chart for Academic Affairs and selected the person most closely connected to undergraduate education.

Once I had an initial contact person selected from each university, I sent individual emails to the identified contact, telling them about my project and asking them to share their policies and procedures pertaining to their early alert systems. In the email, I asked them to respond within two weeks. After two weeks, I followed up with the institutions who had not responded. See Appendix C for the email language used.

In addition to the policies and procedures on early alert systems, I requested data from GVSU's Institutional Analysis on a set of scholarship students who belong to a program that, if the students meet eligibility requirements each year, is highly invested in their success during their entire time at the institution. I asked for the past five years' worth of data, looking at first-generation status, gender, race/ethnicity, grade point average, and DFW rates. This data did not contain any identifiable information and was stored on a password-protected laptop.

Data Analysis

Within six weeks of sending my first emails to the 27 universities that fit my sample, I heard back from the contact people at 13 of the institutions. Due to the nature of qualitative research, I was not looking for a representative sample, but rather information from people associated with institutions that could help me see more detailed information about their early alert structures. One contact person reported in their response that their institution did not have an early alert system, so I had policies and procedures from 12 universities to analyze. Five of the universities directed me to their website where specific information related to their early alert systems could be found. Two sent me documents about their systems. The five remaining institutions shared information through personal correspondence, with four being over email and one over the phone.

While reading through the information, I made notes about patterns and outliers. I did not want to speculate on the themes that would emerge because I did not want to influence the data with my own bias and experience at my institution. This is known as inductive coding. Examining the data “without a predetermined theme or theory in mind” uses inductive logic, which is different from deductive logic in which the researcher has an idea about the themes in mind and goes looking for those themes in the data (O’Leary, 2017, p. 330) As much as possible, I wanted the data to speak for itself.

In analyzing the scholarship student data from GVSU’s Institutional Analysis, I intended to ask GVSU’s Statistical Consulting Center to help with the statistical analysis. Having a third party analyze the data provides an additional layer to prevent bias since the people pulling the data are not also the ones analyzing it. Unfortunately, Institutional Analysis did not provide raw

data, making it difficult to conduct a comprehensive quantitative analysis. This will be further addressed in the discussion on this project's limitations and my suggestions for future research.

Findings

In reviewing the materials provided from the 12 universities, it became clear that the success of most early alert systems depends on the buy-in of the campus community. Ten of the 12 universities rely heavily on individuals connected to an academically-struggling student to raise flags to indicate a concern (Eastern Michigan University, 2020; Hosch, 2022; Indiana University, 2022; Illinois State University, 2022; University of Illinois Chicago, 2022; University of Missouri, 2022; University of Wisconsin-Milwaukee, 2022; K. Brooks, personal communication, 2022; A. Daugherty, personal communication, 2022; J. Klein, personal communication, 2022). This means faculty and others who have a relationship with the student need to see the value in the early alert system and use the early alert software to funnel students into the process. If those responsible for raising flags don't use the system, don't know how, or don't even know it exists, students are not given the opportunity to receive the help they need.

One of the two institutions in my sample who use something other than faculty-initiated alert systems is the University of Nebraska-Lincoln (UNL). UNL has taken a different approach that relies on their learning management system to identify "students who are performing at 50% or less than their peers based on course data" (A. Goodburn, personal communication, October 20, 2022). This is a recent change and is being piloted with three departments instead of their entire study body. Rather than getting buy-in from faculty and staff to raise flags, students are automatically funneled into their early alert system in any class that tracks grades in the learning management system. This approach helps to address the issue of buy-in from those responsible for raising flags. However, this system only focuses on academic performance and does not necessarily consider other factors. It's unclear from the information provided if faculty and staff can raise flags about a student's mental health or struggles with food and housing insecurity, or if

these concerns are only addressed through the early alert system when they impact the students' academic performance. As mentioned earlier, students report that the stress of meeting their basic needs negatively affects their academic performance, so these factors need to be integrated into any system focused on student success.

In addition, relying only on learning management data also leaves out students in courses whose faculty do not use the system or use it minimally. Research from EDUCAUSE found that 85 percent of faculty use the learning management system at their institution, with 56 percent using it daily (Dahlstrom et al., 2014, p. 4). The same study revealed that 83 percent of students use the learning management system, while 56 percent report using it for most or all their courses. This percentage is too low to rely on learning management data alone as huge portions of students are missing from the data being employed.

In another example of systems that don't rely on faculty alerts, Missouri State University's early alert system uses institutional data, like grades, academic probation, course withdrawals, registration for the next term, completion of the FAFSA, and switching to a different major to indicate which students a success coach should follow up with first (K. Wood, personal communication, October 18, 2022). Their system also allows for success coaches to raise flags for a life event, which is an event that has occurred outside of the classroom but may impact academic performance. Unlike UNL's system, this means that housing insecurity, food insecurity, medical emergencies, or other events could be integrated more holistically into the system, although not automatically. Staff are still needed to add that information into the early alert system. Missouri State University's early alert system was launched earlier this year, so it is not fully implemented (K. Wood, personal communication, October 18, 2022). They intend to

include more indicators from their learning management system, such as logins and missed assignments.

In addition to buy-in from faculty and staff to use the system and funnel students into the process, universities need to gain buy-in from the students. Students need an understanding of the early alert system and their responsibility once a flag has been raised. One attempt to increase student understanding of early alert systems is including information about them in all courses. Nearly half of the institutions in my sample specifically encouraged faculty to include language about the institution's early alert system in their syllabi (Indiana University, 2022; University of Missouri, 2022; University of Wisconsin-Milwaukee, 2022; A. Goodburn, 2022; J. Klein, 2022). Many universities also acknowledge the difficulty in getting students to respond and act. To attempt to address this concern, the University of Wisconsin-Milwaukee has added texting as a means of communicating with students to help increase responsiveness (2022). Ohio University used surveys to confirm that students find value in the flags and made a change or took action as a result, like attending tutoring sessions or meeting with their professor (J. Klein, personal communication, October 21, 2022). Evaluating the effectiveness of the early alert system, especially from those it is meant to benefit, is important. Ohio University was the only institution that discussed student feedback systems and their impacts in the materials I analyzed.

The types of flags that can be raised regarding student concerns differed from university to university. Concerns related to academic performance and attendance were the most common types of flags. The University of Missouri-Kansas City also allows for flags related to social, financial, and health concerns (A. Daugherty, personal communication, October 26, 2022). Ohio University plans to add flags for students who are not swiping their identification card at resident halls or dining halls, indicators that would go beyond just academic performance (J. Klein,

personal communication, October 21, 2022). Seven of the institutions directly mention allowing faculty to provide kudos to students for their academic success, which could help reinforce positive performance and confirm to a student that they are doing well (Eastern Michigan University, 2020; Indiana University, 2022; University of Missouri, 2022; University of Wisconsin-Milwaukee, 2022; K. Brooks, personal communication, 2022; A. Daugherty, personal communication, 2022; J. Klein, personal communication, 2022). Positive feedback gives students confidence in their ability by showing them they are succeeding. Furthermore, it helps eliminate questions of self-doubt and instead says higher education is for them.

Providing feedback to students is important for them to understand their success, especially in an environment that is much less focused on grading homework than students may be accustomed to from high school. Regrettably, five universities in this study have chosen to limit which students participate in their early alert system, which seems counterproductive to ensuring student success for all students. Oakland University (Hosch, 2022) and the University of Illinois at Chicago (2022) focus on students in lower-level courses, probably trying to target first-year students who are most vulnerable to withdrawal from the university. Bowling Green State University (BGSU) targets courses selected by the colleges (K. Brooks, personal communication, September 20, 2022). The parameters that BGSU uses in selecting those courses was not mentioned by the contact person from that institution. Missouri State University's early warning system is focused only on first-generation students but hopes to expand its early alert system to all students once its system has been fully developed (K. Wood, personal communication, October 18, 2022). Similarly, UNL is piloting its revised early alert system focused on learning management data with three departments. The reason for a narrow focus could be the result of trying to target limited resources to those who need it most. Unfortunately,

some students will inevitably fall outside these parameters and not receive the benefits of the early alert system.

Limitations, Institutional Data Recommendations, and Future Research

There are some limitations to this research that need to be acknowledged. There is a selection bias in the sample of institutions because they self-selected to be included. It's unknown what, if any, early alert systems the other universities have developed and how those might contradict or confirm the findings of this study.

Furthermore, the information provided by each institution varied widely. Some universities sent documents outlining their early alert systems, while some directed me to their website, and others replied to my email with information they thought I was looking for. This made it challenging to compare the information as it's possible that an element of a university's early alert system exists in practice but not in the materials I analyzed.

The GVSU institutional data also created limitations in this research project. The sample size of one of the scholarships was too small for any analysis to have statistical relevance. By not having raw data, I was unable to do much of any analysis. I couldn't prove correlations between the data markers with statistical support. Institutional Analysis essentially assumed what I was looking for and provided analyzed data based on that assumption. To better support institutional research, Institutional Analysis should instead provide unidentifiable, raw data that can be analyzed comprehensively.

In addition, the information on DFW rates, which identifies students who received a grade of D or F or withdrew from a class, need to be further disaggregated. Grouping grades of a D and F together with withdrawing from a course creates a confusing picture of a student's academic experience and assumes that withdrawing from a course, earning a D, and earning an F all mean the same thing. In some programs, a D is a passing grade. For students who have failed multiple times, a D is also a sign of improvement. Similarly, when a student withdraws from a

course, this decision does not always mean the student failed. A student could have enrolled in a withdrawn course originally for fun and not as a requirement of their degree program. A student who finds themselves overwhelmed with coursework could withdraw from a course to improve their mental health and their success in their other classes.

As noted earlier in this paper, prior research of college persistence has focused on examining institutional administrative data (Diehl et al., 2020, p. 420) and more research is needed on the student experience and how students make decisions (Brunsdon et al., 2000, p. 308). The focus on quantitative research of administrative data that is easy to collect, like high school GPA, SAT/ACT scores, gender, and race/ethnicity, doesn't provide the full context of what the student experiences. To understand students' experiences, universities administer campus climate surveys, but they often fail to dive deeper into the reason behind the responses. Research that uses student stories to understand the root causes of the issues identified in past research of administrative data is the direction research needs to head. If Institutional Analysis, in partnership with faculty, could prioritize this area of research, we might be able to create new breakthroughs in our understanding of college persistence.

Moreover, future research into early alert systems could try to address the limitations of this study by getting data from additional Midwestern universities or by interviewing representatives from the universities to ask each of them the same questions about their early alert structures. More research focused on the students at these institutions, especially those that use a qualitative analysis, is also needed. Early alert systems are designed to impact the students, so it's important that their input is included. What information do students need and are they getting that information from the current systems being used?

Conclusion

Early alert systems being used by mid-sized universities in the Midwest differ from institution to institution. The variability in the early alert structures was a consistent theme and made this study challenging to analyze as I was not always comparing the same information. The policies and procedures discussed similar items, but one may not have been as specific as another.

While not all findings are generalizable, important elements for the ideal early warning structure emerged. Early alert systems need data from learning management systems while also maintaining the flexibility to include data not known from the learning management system to provide the most comprehensive picture to encourage student success and retention. If grades are entered in a timely fashion, learning management systems can provide real-time feedback on a student's academic performance.

However, this study shows that grades are not the only factor to look at when considering student success. Early alert systems also need to account for other factors like health emergencies and food insecurity. Thus, the use of early alert systems is still dependent on the campus community's adoption of not just the perspective of early alerts, but also the software systems used for this alert process. The people connected to the student need to believe that their efforts to raise flags will empower students to make changes. Making sure students are aware of the early alert system by providing language about it in each syllabus and having instructors talk about it in each class will increase awareness among students.

In addition, early alert systems that provide kudos and concerns reach all students irrespective of their academic performance. This broadens the utilization of the system and could enhance the campus community's adoption of it. This is also true of early alert systems that

cover all students and not specific sub-populations, like only lower-level courses or first-generation students. The ideal early alert system, is one that is holistic in nature, covering the spectrum of encounters students may experience.

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Appendix A: IRB Determination Letter



DATE: September 15, 2022

TO: Krista Benson Ph.D.
FROM: Office of Research Compliance & Integrity
STUDY TITLE: Early Warning Systems: How to Identify Students Who Need Support Early Enough to Change Their Trajectory Towards Graduation
REFERENCE #: 23-045-H
SUBMISSION TYPE: IRB Research Determination Submission

ACTION: Not Human Subjects Research
EFFECTIVE DATE: September 15, 2022
REVIEW TYPE: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does meet the definition of research* according to current federal regulations but it does not meet the definition of human subjects**. This project, therefore, does not require further review and approval by the IRB. While performing this project, you are expected to adhere to the institution's code of conduct and any discipline-specific code of ethics.

A summary of the reviewed project and determination is as follows:

The purpose of this project is to obtain the policies and procedures of other universities as they relate to early warning systems for underperforming students. These documents will be analyzed to identify key components of effective early warning systems. Because this research is about the universities and not about any individuals, this research does not involve human subjects and IRB oversight is not required.

This determination letter is limited to IRB review. It is your responsibility to ensure all necessary institutional permissions are obtained prior to beginning this project. This includes, but is not limited to, ensuring all contracts have been executed, any necessary Data Sharing Agreements and Material Transfer Agreements have been signed, and any other outstanding items are completed.

If you have any questions, please contact the Office of Research Compliance and Integrity, at (616) 331-3197 or rci@gvsu.edu. The office observes all university holidays. Please include your study title and reference number in all correspondence with our office.

*Research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge (45 CFR 46.102 (f)).

**Human subject means a living individual about whom an investigator (whether professional or student) conducting research: (i) obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or (ii) obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens (45 CFR 46.102 (e)).

Appendix B: Starting Sample Pool of Universities

The universities asked to be part of this study are:

- Ball State University
- Bowling Green State University Main Campus
- Central Michigan University
- Cleveland State University
- Eastern Michigan University
- Illinois State University
- Indiana University Purdue University Indianapolis
- Iowa State University
- Kent State University at Kent
- Miami University
- Missouri State University Springfield
- Northern Illinois University
- Oakland University
- Ohio University Main Campus
- University of Akron Main Campus
- University of Illinois at Chicago
- University of Iowa
- University of Missouri Columbia
- University of Missouri Kansas City
- University of Nebraska Lincoln
- University of Nebraska at Omaha
- University of Toledo
- University of Wisconsin Milwaukee
- University of Wisconsin Oshkosh
- Wayne State University
- Western Michigan University
- Vincennes University

Appendix C: Email Script

Email script used to reach out to university representatives:

Good afternoon, [University Contact's Name]!

My name is Samantha Mayse, and I am the Director of Thompson Scholars and Special Projects for Enrollment Development and Educational Outreach at Grand Valley State University. In this role, I oversee the university's largest donor funded scholarship with more than 1,100 students participating in the scholarship program this year. In addition, I am a graduate student at GVSU, working on my master's project this semester, and I hope you can assist me.

For my master's project, I'm interested in improving student success outcomes for students, and am looking at early alert systems as tools to identify students who may be struggling early in the semester so that educators can intervene and have a positive impact on the students' academic performance. I'm reaching out to other 4-year public universities in the Midwest with enrollment between 13,000 and 33,000 students to ask them to share policies and procedures on their early alert systems so that I can analyze them.

Does your institution have an early alert system in place? If so, could you share the policies and procedures surrounding your early alert system with me?

Thank you and I look forward to hearing from you soon.