AN EXPLORATION OF THE EFFECTIVENESS OF SIS IN MANAGING STUDENT PERFORMANCE

# An Exploration of the Effectiveness of SIS in Managing Student Performance

By: Sylvester Ngoma

Ph.D. Candidate

Email: nngoma@carolina.rr.com

December 15, 2009.

---

Sylvester Ngoma teaches Foundations of Information Technology (FIT) and Scientific and Technical Visualization in a college-preparatory, secondary school in the state of North Carolina in the United States. He is pursuing a doctorate degree in Information Technology.

## Abstract

The use of Student Information Systems (SIS) to enhance school administration and manage student performance in K-12 education has received increased attention in recent years. As SIS become more integrated operational tools in schools, many school districts have to make decisions about the extent to which SIS affects student achievement and about the most appropriate SIS to adopt. Although many school districts are implementing Student Information Systems (SIS), there is little empirical evidence about whether SIS use can improve student performance. This article seeks to contribute to explicit understanding of the effectiveness of SIS within the context of K-12 education. It examines the effectiveness of one specific SIS — NCWISE— used in several hundreds of schools in the state of North Carolina in the United States.

Table of Contents

# An Exploration of the Effectiveness of SIS in Managing Student Performance

## Introduction

During the last decade, the use of electronic student information systems (SIS) in education has dramatically increased. With the growing strategic importance of SIS, more school districts are implementing SIS. As of 2006–07, nearly all school districts maintained at least some student data electronically (U.S. Department of Education, 2008). According to a 2006-07 national survey by the U.S. Department of Education's National Educational Technology Trends Study (NETTS), the types of data stored include attendance (94 percent), grades (91 percent), student demographics (90 percent), some administrative data such as special education information (89 percent), and course enrollment histories (86 percent).

Barrett (1999) notes that in an effort to efficiently document and maintain accountability data, schools are relying more on technology in the form of student management information systems (SMIS) (p. 4). The *National Center for Education Statistics* points out that “The maintenance of extensive, accurate, historical, and current data about individual students is essential to the functioning of schools and school districts, and can promote effective educational practices at all levels of the education system” (NCES, 2000, p.2).

Despite this increase in the use of student information systems, research on why and how the use of SIS is effective in K-12 education remains minimal. The purpose of this paper is to discuss the overall effectiveness of electronic student information systems. Simply put: “Does SIS use improve student achievement?” In an attempt to answer this question, I reviewed existing literature and surveyed teachers and administrators who use the North Carolina Window of Information on Student Education (NCWISE) —a web-based student information system —

to examine the effects of NCWISE on student performance. Following discussion of my analysis and results, I report the findings of my analysis and present the implications of my research.

## Definition

Information systems used to manage student data have been referred to in various ways: Student Information Systems (SIS), Student Management Information Systems (SMIS), Student Data Systems (SDS), Student Data Warehouse (SDW), Student Academic Information Systems (SAIS), or Student Information Management Systems (SIMS).

Barrett (1999) encapsulates the essence of a student information system. He defines SMIS as "an integrated software package that maintains, supports, and provides inquiry, analysis, and communication tools that organize student accountability data into information to support the educational process" (p. 4).

The U.S. Department of Education (2008) views student data systems as encompassing "hardware and software that provide many different functions to users, such as storing current and historical data, rapidly organizing and analyzing data, and developing presentation formats or reporting interfaces" (p. 2). The IDANET Steering Committee (2003) defines ISIMS as "a secure, centralized data system where public school information is stored, accessed and analyzed" (p. 2).

The type of student data these systems store may vary. NCES (2000) describes the contents of SIS as follows:

> "Typical contents may include family information, courses taken and grades, special program participation information, immunization records, assessment scores, extracurricular activities, and other information that is used by the education system to promote student success and provide appropriate services. Some of this information

should be standard across classrooms, schools, districts, and states, while other information can be unique to the particular classroom, school, or district" (p. 2).

Regardless of its content, a student information system is designed to meet one primary goal: improved student achievement. School districts committed to improving student learning analyze data in order to plan for the future through understanding, among other things, the current and future needs of the district, schools, students, teachers, parents, and community (Bernhardt 2006, p.2). But student data are often stored in forms that are difficult to access, manipulate, and interpret (Wayman, 2005, p.2).

It is worth noting that the use of SIS raises several unanswered questions. Does everyone on staff know which programs are working and which ones are not, across the district? Does staff know how attendance, discipline, and retention rates affect student learning results? Do districts analyze data to understand which strategies are not working and what to do differently to get different results (Bernhardt 2006, p.30)? Can teachers analyze student data and establish with certainty how perfect attendance affects student learning? By and large, how effective are student information systems? Do they affect student performance?

## Background

Until fairly recently, student records were not readily available to students, teachers, parents, and school administrators. "Student records traditionally have been kept only at the school or district level. In recent years, however, many state education agencies have begun to collect individual student records. State-level records typically consist of data about student characteristics, program participation and assessment results—a subset of the data usually maintained at the school and district levels" (NCES, 2000, p. 3).

Across the nation, many schools struggled to find systems that allowed greater parental involvement. Westside Community Schools, a school district in Omaha, NE, exemplify this difficulty. This district is composed of more than 6,000 students attending 10 elementary schools, one middle school, and one high school. Prior to adopting a Web-based SIS that gives parents access to data on their child's attendance, grades, evaluations, and general activities, the district used to face several obstacles. Bird (2006) describes these obstacles in the following terms:

> "Parents who wanted an update on their kid would have to call the principal's office or the teacher's direct line. Parent-teacher conferences came too late to reverse a student's lack of progress. Parents of older students were offered few opportunities to stay involved" (¶ 3).

Specifically, web-based student information systems such as PowerSchool, ISparta, and TeacherEase have helped improve student records management, and school improvement plans. These tools are reported to be useful for administrators and teachers alike. According to The Journal (2000), "Administrators no longer need to run from classroom to classroom or search from file to file to get the information they need, as the system (PowerSchool) provides instant access to all student records with a simple point and click" (p. 92).

Despite the fact that student information systems play a vital role in school administration, schools have not always been early adopters of efficient and effective student data management technologies. Barrett (1999) observes that "Although the use of information systems to immediately access accurate and comprehensive information is critical for a successful business, schools often lagged behind in the implementation of information technologies" (p. 4). North Carolina public schools, for example, only replaced SIMS — which

was the official public schools' data collection source — in 2004; that is, almost 20 years after it was implemented. Yet, SIMS had clearly become outdated and antiquated.

Recently, school districts have been under considerable amount of pressure to adopt student data systems which promote student learning and parental involvement. Wayman (2005) points out that accountability mandates have drawn attention to the practical use of student data for school improvement. "A familiar example is the 2002 No Child Left Behind (NCLB) legislation, which mandates a significant increase in the gathering, aggregation, and upward reporting of student-level data" (Wayman, 2005, p.3).

Feldman and Tung (2001) observe that "Schools are inundated with a wide variety of data and are looking at ways to understand how to interpret the data that is provided to them, as well as how to use the process of inquiry to improve the quality of instruction offered by their school" (p. 4). "In the past, the usual way typical school district personnel dealt with data was to analyze the dickens out of their annual state assessment results, develop a plan to increase the lowest scores, and then wait for the next year's results to come out to know if their plan made a difference. Many found they could improve their assessment results in that area, only to discover that other subject-area scores declined" (Bernhardt, 2006, p. 362).

There is limited literature related to the use of student information systems in educational administration. Despite widespread adoption of student information systems, there is little research, as Barrett (1999) puts it, investigating the impact of the educational leaders' awareness of the potential benefits of an SMIS and its effective implementation (p. 6). But, as school districts invest large amounts of money in SIS, there is a dearth of empirical evidence about the effects of SIS use on student performance and on increased parent involvement. More studies are needed to prove or disprove the benefits of SIS.

## Student Data Use and Performance

Does the presence of a web-based SIS imply learning? Wayman (2005) believes that SIS use is positively associated with improved student performance and that the thoughtful use of student data positively correlates with a range of measures of student achievement. “With classroom access to these tools, school systems have the opportunity to allow every teacher to have access to previously unattainable data describing their students. These data can be turned into information to improve classroom practice”(p. 3). Wayman (2005) cites Chrispeels, Brown, and Castillo (2000) who demonstrated that “data use can be a strong predictor of the efficacy of school improvement teams: Data use not only increased efficacy directly, but served as a mediator for the positive effect of other factors” (p. 4).

At Westside Community Schools in Nebraska, Bird (2006) argues that there were significant improvements as a direct result of the adoption of the new SIS. “Since the implementation of the SIS, attendance at Westside is better than ever, discipline reports are down, and, instead of declining test scores that are common in schools with similar demographics, test scores are consistently above the national average and among the highest in the state of Nebraska. School administrators attribute this in good part to the SIS” (¶ 4).

In a study of six schools in Massachussetts conducted by Feldman and Tung (2001), schools involved in data use often evolved toward a more professional culture and teachers became more reflective about their practices. On the other hand, students in these schools were directly and indirectly influenced by the process.

Bernhardt (2006) analyzed student demographic and perceptual data of elementary, middle, and high schools of Canyon View School District (an 8,000 student district) and concluded that fact-driven decision making can provide each district, each school, each class and each student with a reliable way to facilitate breakthrough performance and continuous education improvement. Her findings revealed that effective use of school data leads to more objective education-enhancement decisions.

## Assessing SIS Effectiveness

While student information systems are being widely embraced by school administrators, it is worth examining how effective they are in managing student performance. Barrett (1999) investigated the effectiveness of student management information systems (SMIS). He notes a lack of adequate strategies or knowledge when adopting such systems. He writes: "it is apparent that school districts may be installing elaborate SMISs without adequate strategies and knowledge about how to use them effectively or the extent of their effects on the functioning of the school system" (p. 5).

Regarding NCWISE, for example, Parent Assistant, which offers parents the possibility of being able to log on to NC WISE to check on their child's performance in school has only become a reality statewide this past September 2009. In North Carolina, a vast number of school teachers, administrators, leaders, parents, and students are using NCWISE to access and manage student data. How effective is NCWISE? Does it have a direct impact on student performance?

## Case Study of NCWISE

In the framework of this paper, I decided to examine a student information system used in over 1,000 schools in the state of North Carolina. It is the North Carolina Window of Information on Student Education, commonly referred to as NCWISE. It was first introduced to

North Carolina Public Schools in 2004. In 2009, NC WISE was implemented throughout the state's 115 LEAs and 98 charter schools. NC WISE is composed of three basic components: Electronic Student Information System (eSIS) which allows individual schools to manage student information, Electronic Data Interchange which provides the capability to electronically transmit all student instructional records and demographic information between school districts, between schools within a district and to universities and colleges in North Carolina, and Uniform Education Reporting System (UERS) which transfers information from the local school district to the North Carolina Department of Public Instruction (NCDPI).

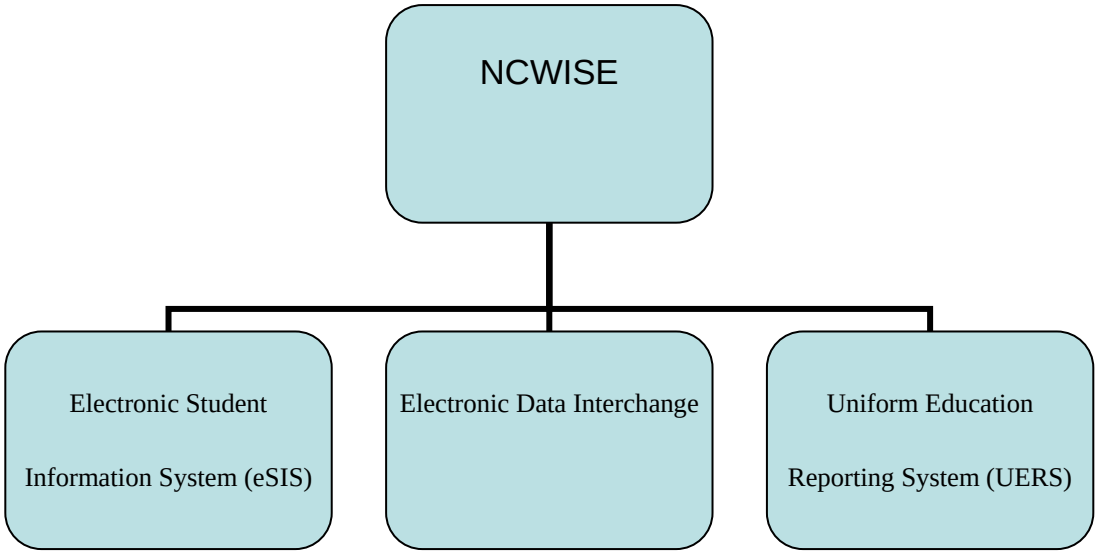


Figure 1: NCWISE Components

NCWISE is described as a web-based, integrated, and secure tool for effectively managing student information and improving instruction in North Carolina schools. It was designed to provide teachers, principals, counselors, nurses, central office staff, and others with direct and immediate access to a full spectrum of data on a student's entire career in the North Carolina school system. NC WISE is said to support federal and state reporting requirements associated with No Child Left Behind, ABCs Accountability, School Report Card, and Closing

The Gap. Why was NCWISE selected and adopted? How effective and efficient has it been as a student information management tool? Who was part of the design/development/deployment team?

April 1, 2009 marked the completion of NCWISE full deployment in 113 of the state's school districts - which includes 1,391 schools, and all 98 charter schools (NCDPI, 2009, ¶ 1). The NCDPI (2009) report lists some of the features of NCWISE which include “the ability to move student transcripts immediately when a student transfers from one school to another; produce progress reports and report cards; share student grades and emergency information with appropriate school employees; and more quickly and accurately report student grades, attendance, and information used to support public school business processes” (¶ 4). The reason given for the adoption of NCWISE is that SIMS, which was the official public schools' data collection source for more than 20 years and relied on antiquated technology (¶ 5). Let it be noted that NCWISE replaced SIMS.

As a Charlotte-Mecklenburg technology (CMS) education instructor, I was quite surprised to learn that Charlotte-Mecklenburg and Wake County schools, the two largest school districts in North Carolina, were not part of the initial deployment plan. Although CMS staff and Wake County Schools staff use NCWISE already, each of the state's two largest districts operates the same software but hosts their data separately. It was reported that work was underway to link them into the statewide NC WISE environment by June of 2009!

## Methodology

My research focused on NCWISE users in North Carolina's public schools. The research study required the use of a field study. I conducted a survey and semi-structured interviews. A questionnaire was administered electronically to a group of 80 public school teachers and administrators for a return rate of 25 %. Respondents were selected in a systematically random fashion. Some of the participating professionals have been using NCWISE since it was implemented in 2004; some have been using it more recently.

Due to time constraints, several important factors were not considered for this study. Data collection covered a period of one week. The demographic characteristics of the respondents were deliberately ignored. A simple random sample was used for this informal inquiry.

## Research Questions

The survey questionnaire consisted of six open-ended questions related to the use of NCWISE. The questions were designed to capture NCWISE users' perceptions of the effectiveness of this SIS. The following questions were addressed.

1. List three features of NCWISE that you find useful.
2. List three things that you wish NCWISE could do but does not do.
3. What do you perceive as problems with NCWISE?
4. How does NCWISE affect your student performance?
5. What factors were taken into account for the selection and adoption of NCWISE?
6. Were you involved in the decision-making process that led to the selection and adoption of NCWISE?

## Results and Discussion

Research question 1 focused on three features that NCWISE users liked. Responses to this question were grouped into three broad categories. The following table has some of the responses.

TABLE 1

Three Useful Features of NCWISE

**Research Question 1: List three features of NCWISE that you find useful.**

| User-friendliness/Data availability/ Access/ | Grade Management | Parent/Student Involvement/Other |
|---|---|---|
| • It is easy to use<br>• You can access from almost any computer<br>• You can set up teams or clubs to check student grades in classes<br>• Internet access from most places<br>• Attendance look up<br>• Absence tracking<br>• The ability to add comments on a student's grade.<br>• Attendance access<br>• Through Parent Assistant, parents/students can view grades online<br>• Easy to generate reports<br>• Behavior in other classes<br>•It lists home language, the incidents/suspensions/teacher notes of a kid so you can see what all they are capable of, and country of origin<br>• Attendance taking--much better than reporting on paper; a student's attendance in all 4 periods is "compiled" automatically and is visible to other teachers.<br>• Easy access to student information such as absences, | • Semester and year grade calculations--done automatically, avoiding "math mistakes" of old manual methods and also data-entry errors when we had to "bubble" grades, attendance, etc. on scan sheets.<br>• The reporting of students grades with progress reports<br>• Direct posting for final grades<br>• Gradebook setup<br>• Ability to rank assignments in proportion to importance<br>• Ability to share assignments between classes<br>• Electronic grade<br>• Student demographics, notes, attendance | • I find it useful in communicating with parents.<br>• This is a great way to document students conduct on a particular assignment.<br>• Up to date information on students home<br>• The colors used in the spreadsheet are helpful<br>• Good spreadsheet<br>• Parental contact information<br>• Parent assistant--if kept up, this eliminates a lot of phone calls, emails, etc. from parents inquiring about their student's progress. |

| | | |
|---|---|---|
| schedule, etc. | summary<br>• Grades/marks reporting, and many other tasks.<br>• The ability to modify assignments and grades after they have been inputted is also helpful. It gives students the opportunity to do make up work, and corrections to big assignments they did poorly on. | |

Based upon the results of the first question, it appears that teachers and administrators are satisfied with the user-friendliness of NCWISE, the availability of student performance data, and the window of communication that NCWISE opens with parents.

Research question 2 was designed to explore features that users believe that NCWISE lacks. Some of the most common responses to this question are listed in Table 2.

TABLE 2

Features NCWISE lacks

**Research Question 2: List three things that you wish NCWISE could do but does not do.**

| Better data analysis | More functionality |
|---|---|
| • Generate user friendly seating charts<br>• Give users the ability to modify reports (take out student ID numbers, etc.)<br>• Ready link between NC Wise and Word for discipline referrals<br>• Would like to see the history managed differently.<br>• Would like a little more customization.<br>• Student passwords similar to "Parent Assistant" so that they can view their | • Email progress reports home<br>• Allow me to grade and record, it times me out, and does not, to the best of my knowledge, allow me to put in assignments than print out a copy of them blank to hand put scores in for recording later.<br>• Ready link between NC Wise and Word for letters to parents<br>• Test taking and scoring, emailing parents |

| | |
|---|---|
| grades.<br>• Allow students who are in the same classroom doing the same assignments to be grouped on the same spreadsheet even if they are taking different "flavors" of the same course. If it works on attendance screen, why not on the spreadsheet?<br>• Progress reports showing only Assignment Type averages instead of every single assignment should be possible as well.<br>• Can't handle blank grades, no long file names for tasks, no dual enrolment for schools<br>• Adding scores to a single assignment sheet is intimidating; I have used it in other packages and don't have time to figure it out in this one.<br>• Drop the lowest grade for each student with a button click,<br>• Do end of term grades on one screen instead of three<br>• Automatically email parents at a specified time with progress report. | directly, be more up to date with parent information.<br>• Would like it to be more flexible in working with other apps.<br>• Less complication for grade submissions for Mid-term and Final Exam.<br>• I wish it had a picture of the kid, a Google map of where they live approximately, and a report that would automatically sort through classes and list the kids by EC accommodations.<br>• Allow user to adjust format of reports to use paper efficiently. The uneditable PDF output is often very wasteful.<br>• Reporting Term Marks printout does not include teacher's name, and for 36-week courses is missing the final column (the actual course grade!).<br>• Allow us to set the semester dates and have it know what semester we are in. This would save a lot of clicks.<br>• Allow us to enter information once when we are copying assignments to other classes or at least offer the info we have already provided as a default, this would also save a lot of clicks.<br>• Allow us to see our students' schedules so we can contact the students other teachers when needed.<br>• Give us a link to send email to parents and store their email addresses. |

The analysis of data reveals that users expect NCWISE to generate dynamic charts and graphs and to have added functionality. Some of these features already exist; some NCWISE users may be unaware of them. This is why continuous in-service training sessions are needed. On the other hand, most of the suggested new features would make NCWISE hassle-free and more cost-effective.

Research question 3 sought to sort out problems that teachers and school administrators currently have with NCWISE. The most salient responses are reported in Table 3.

Table 3

Problems with NCWISE

**Research Question 3: What do you perceive as problems with NCWISE?**

| Dependability | User-friendliness | Centralization |
|---|---|---|
| • COTs product brings certain limitations. Lots of demand -- hard to meet all demands. Print is automatically routed (in our district) to some software rather than simply printing as requested. If I want a copy, I'll make one.<br>• It might, but I do not know how to select what information about grades can be observed by parents. It seems to either yes or no.<br>• The unreliability of the program. It is always crashing and performing slowly. I can not use the program at home which would be useful.<br>• When student information is updated at the school level, it takes a while to update in the system<br>• On the Parent Assistant, parents are shown a "global" mark that is the numerical average of all assignments (regardless of weights, different grading periods, etc.) and thus not the | • It is web based, it is not always user friendly (there is definitely a learning curve), connection depends on access results, locks up often (sometimes does not save properly)<br>• Need to interface with other apps.<br>• Program is not user-friendly Entering grades and calculating the grades for the report card is a confusing process if you have never done it before.<br>• Dual enrolment for students, clunky entry for tasks, open access, poor security from hackers<br>• Too many clicks to get anything done<br>• It is chronically hard to log on to.<br>• I would prefer a system where I am not putting grades immediately online, but can upload when ready.<br>• Missing task reports do not include anything that has been given a zero but we should have the | • CMS is not on the same server as the state, so when a kid comes here from out of Mecklenburg County all of their data like test scores has to be hand entered.<br>• When the system is down, there is no access<br>• What if the server and backup both crash?<br>• Offline / System down /Slow during peak use<br>• Beyond the specifics mentioned above, NCWISE is too slow and clunky to use for "fine detail" grading of classes with many individual assignments. |

| | | |
|---|---|---|
| student's actual mark. This is very confusing to them and causes disputes with teachers. | option of including them.<br>• Wastes a lot of paper.<br>• Headings on the reports are not meaningful, too much info, the important info is not emphasized such as what period a class report has been created for is tiny compared to a big title that has no relevance to the teacher. | |

Problems surrounding the use of NCWISE were divided into three broad categories: dependability, user-friendliness, and centralization. Users generally expressed concern about the complexity of NCWISE, the lack of user-friendliness and its slowness due to the fact that it is centralized. One of the pitfalls of a highly centralized system is that it may crash, and affect the whole network. Kahai et al (2003) point out “security vulnerabilities” as another disadvantage of IS centralization. They argue that “high centralization leaves an organization rather vulnerable to disasters…” (p. 59). They go on to say that “Having hardware, software, and data backup strategies, and having hardware at alternate locations allows organizations to quickly continue operations from alternate locations in case of disasters, whether man-made or natural” (p. 59). Hence, school districts need to strike a balance between high SIS centralization and high SIS decentralization.

Research question 4 examined beliefs and perceptions about the correlation between NCWISE use and student performance. Some responses are shown in Table 4.

Table 4

NCWISE and Student Performance

**Research Question 4: How does NCWISE affect your student performance?**

| Yes… | No… | Don't Know/Neutral |
|---|---|---|
| Students who regularly access Parent Assistant are more inclined to keep abreast of their grades and strive to maintain a higher GPA<br>It helps to show students where they stand at a moments notice.<br><br>Parents can keep up with student grades so that they stay on top of the work that students complete.<br><br>I can give students better faster feedback. It saves time and I can spend the saved time helping students and planning.<br><br>I think it helps kids and parents know where they stand and that helps them improve before the final grade. No surprises.<br><br>For students/parents who check their status online, NCWISE (like TeacherEase, etc.) helps motivate them to keep up with assignments, study for tests, etc. | Not that much, The students grade is more of a factor than the way in which it is recordered.<br><br>I can constantly update students on their grades so that they know how they can improve.<br><br>It does not affect my students' performance at this time; I do not have enough training to know how to make it accessible and practical information for them.<br><br>It does not allow me to keep track of their progress and give them feedback as easily as the spreadsheet program we used previously due to the problems with the missing task reports not showing assignments that have received zeros. | I am not a teacher, so I have no response.<br><br>Aside from the parent/student access feature, NCWISE's effect is about the same as that of any other computer-based grading program.<br><br>No more so than any grade book has ever affected performance. |

In view of these responses, it appears that some teachers and school administrators are cognizant that increased communication between school and parents can result in altering student attitudes and, thereby affecting student performance. It should also be noted that several NCWISE users are not yet convinced that NCWISE can positively affect their student learning.

Research questions 5 dealt with factors that affected the implementation of NCWISE. Most respondents were not able to provide clear factors that were taken into account for the selection and adoption of NCWISE. One of the respondents offered a tentative explanation. "The

reason for this is that the selection, criteria, and moving forward with NC WISE came about through the legislature and was funded by the General assembly. This goes back to 1999 with the first implementation in 2004. One of the key factors to do the NC WISE program was due to the aging SIMS (Student Information Management System) that was in place in 1985 and needed to be replaced. The selection of the core technology that supported NC WISE was done through a competitive bid process and then there is the NC WISE program that ties into multiple systems as well as providing its key functionality". A few respondents shared the following comments: "I do not think anyone in NC had a choice! At least now it is free for us to do grades and attendance online and school systems do not have to pay for the rights to use Integrade, etc.", "I have no idea!**", "**I don't know, it was adopted when I got here.", "Ability to report to parents over the internet.", "I don't know I was not asked or included on any decision making process that I am directly aware of.", "I have no clue, downtown did it", "decision is above my pay grade", and **"**All I know is that they wanted a single system to integrate scheduling, grades, attendance, and parent communication, and they wanted all schools in NC to use the same system--perhaps to facilitate monitoring and comparisons. Some of the limitations of individual NCWISE functions are probably related to this integration requirement."

To be effective, it is crucial that the SIS design and development plans be aligned with educational goals. Before adopting a multimillion SIS, school districts must conduct multi-phase planning studies involving end-users at all levels, especially teachers and school administrators. As Hartono et al (2003) put it, "Such planning for implementation encompasses the identification of specific actions for implementation. The use of careful reasoning to determine priorities and the quick completion of the SISP study are also apparently tied to deliberate planning for implementation" (p. 49).

As responses to research question 6 revealed, none of the respondents was involved in the decision-making process that led to the selection and adoption of NCWISE. One respondent's response sums it up: "No - from the trickle down theory, I was instructed to use it!" It could well be argued that the resolution to implement a statewide SIS came from the legislature.

However, in order to guarantee that the SIS was user-friendly and fulfills the users' requirements for output, end-users (notably educational leaders, administrators, teachers, parents, and students) should have played a major role in the design and development of NCWISE. By being part of the strategic planning team, they could leverage the ideas needed to make NCWISE a more dynamic asset for student data management and data analysis.

## Conclusion

It is my belief that this study will encourage further research to examine the link between student information systems and student performance. There is a vast body of literature that illuminates the existence of this link. This study has reviewed some of that literature. But more studies are needed to prove how SIS effects can be measured and operationalized in measurable terms.

In sum, several districts are implementing data analysis tools with varying degrees of success. Bernhardt (2006) argues that school districts that do not have a data warehouse need one. "It is simply no longer an option not to have one" (p. 358). However, it is one thing to adopt a system information system; yet another to ensure that it is efficient and effective in improving student learning. It is not enough for a student information system to store student data. It should allow users to analyze the data stored and make informed educational decisions. Interactivity, user-friendliness, access to statistics, and data visualization are all core features that contribute to the efficiency and effectiveness of a student information system.

## APPENDIX A

Questionnaire

Dear Sir/Madam:

I am writing an essay on the Effectiveness of Student Information Systems (SIS) in Managing Student Performance for a class I am currently taking and need your input. NCWISE is one of the SIS that I am writing about. I should be most grateful if you could spare a few minutes of your precious time to answer the following questions. I would like to assure you that your responses will be treated in strict confidentiality.

1. List three features of NCWISE that you find useful.
2. List three things that you wish NCWISE could do but does not.
3. What do you perceive as problems with NCWISE?
4. How does NCWISE affect your student performance?
5. What factors were taken into account for the selection and adoption of NCWISE?
6. Were you involved in the decision-making process that led to the selection and adoption of NCWISE?

Sincerely,

Sylvester Ngoma
Ph.D. Candidate
Information Technology Teacher
Charlotte-Mecklenburg Schools

## References

Barrett, S. (1999). Informations systems: an exploration of factors influencing effective use. *Journal of Research on Computing in Education*, 32(1), 4-16. ISTE.

Bernhardt, V.L. (2006). Using data to improve student learning in school districts. *Eye on Education, Inc.* Larchmont, NY.

Bird, K. (2006). Student information systems: How do you spell parental involvement? s-i-s *T.H.E. Journal*, 0192592X, 20060201, Vol. 33, Issue 7. Retrieved November 22, 2009 from ERIC Database.

Career and Technical Education Reporting. (2009). Ncwise: north carolina window of information on student education. Retrieved from http://www.ncwise.org/newsletter2.html

Feldman, J., & Tung, R. (2001). Using data-based inquiry and decision making to improve instruction. *ERS Spectrum 19*(3), 10-19.

Hartono, E., Lederer, A.L., Sethi, V. and Zhuang, Y (2003). Key predictors of the implementation of strategic information systems plans. *The DATA BASE for Advances in Information Systems* - Summer 2003, 34(3), pp. 41-53.

Idanet Steering Committee. (2003). Idaho student information management system. *The Journal: Transforming Education Through Technology*. Retrieved November 11, 2009 from http://thejournal.com/articles/2004/07/01/idaho-from-dreams-to-reality-the-idaho-student-information-management-system.aspx.

Jones, T.H., & Paolucci, R. (1999). Research framework and dimensions for evaluating the effectiveness of educational technology systems on learning outcomes. *Journal of Research on Computing in Education*, 32(1), 17-26. ISTE.

Kahai, P., Carr, H., & Snyder, C. (2003). Technology and the decentralization of Information systems. Information Systems Management, 20(3), 51.

National Center for Education Statistics. (2000, October). Building an automated student record system. *Office of Educational Research and Improvement*. U.S. Department of Education. NCES 2000-324.

North Carolina Department of Public Instruction. (2009). North carolina public schools complete ncwise deployment; ncwise is largest technology project in public schools' history. News Releases 2008-09. April 1, 2009. Retrieved on November 28, 2009 from http://www.dpi.state.nc.us/newsroom/news/2008-09/20090401-01

The Journal. (2000). Web-based student information system simplifies records management. *The Journal: Technological Horizons in Education*, Professional Development: New Destinations in Technology Training. May 2000. 27(10), 92-93. Tustin, CA: USA.

Wayman, J.C. (2005, Summer). Involving teachers in data-driven decision-making: using computer data systems to support teacher inquiry and reflection. *Journal for Education of Students Placed At Risk, 10*(3).