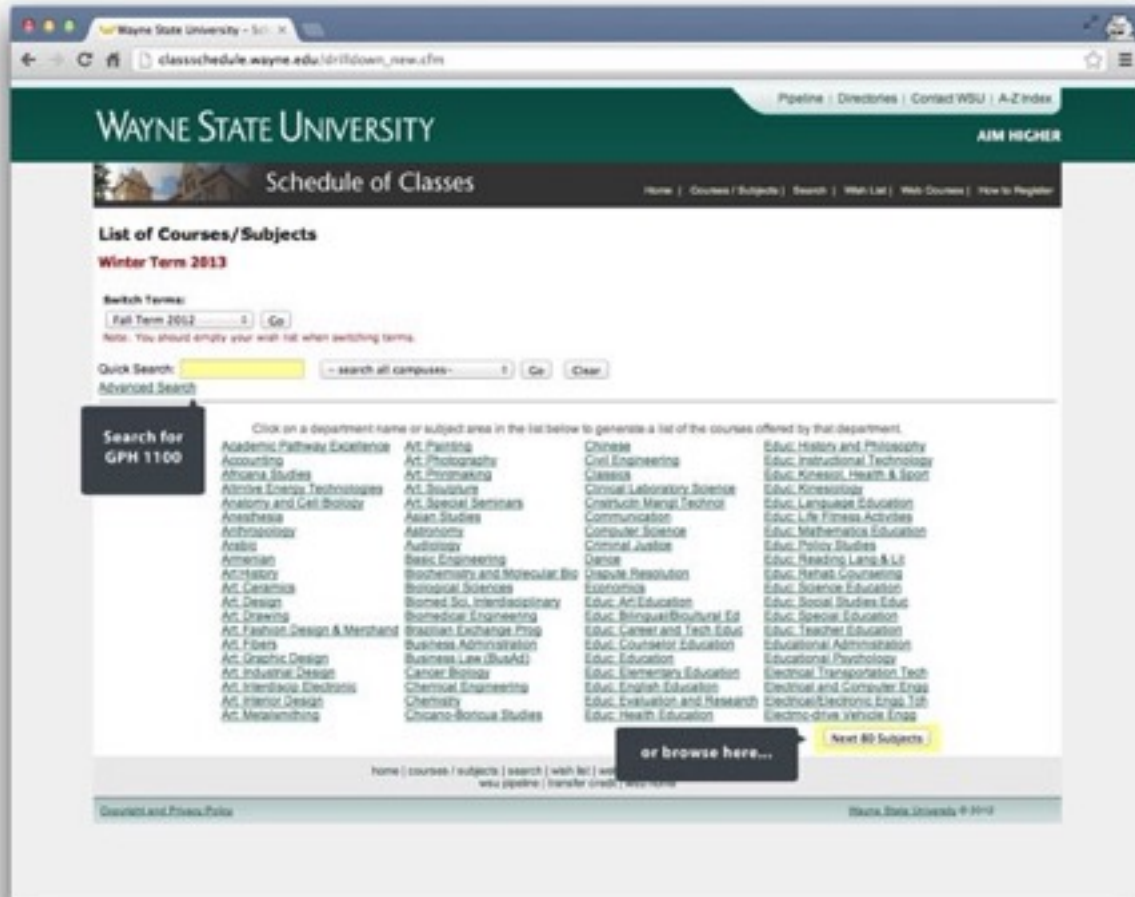


Improving the Course Registration Experience at Wayne State University



Prepared for the Students and Faculty at Wayne State University

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Executive Summary

The current course registration application at Wayne State University is outdated and at times, unreliable, making it difficult and frustrating for students to choose and apply for courses. The current application is functional but it lacks some key features that would be beneficial to the students of the university, as well as the faculty. To bring these features to the university, there are a number of routes that can be taken:

- Develop a New Course Registration Application
- Make Changes to the Current Course Registration Application
- Purchase a New Course Registration Application

Each of these options were explored and researched using a combination of different sources. First, we focused on the changes that needed to be made to the current application. To do this, we evaluated the university's current course registration application and proceeded to evaluate the course registration applications at other universities. We evaluated each application for its functionality using the following criteria,

- Speed & Availability
- Ease of Use
- Efficiency
- Design

Following the evaluations of the course registration application at Wayne State and other universities, we looked at student feedback. We started by exploring social media for comments about the course registration application. Afterwards, we gave a survey to students and asked them a number of questions that related to our criteria for the functionality of the application.

We then came up with 3 alternative solutions for the course registration application and evaluated each one of these using the following criteria:

- Ease of Implementation
- Number of Concerns Addressed
- Technical Requirements
- Cost

We came to the conclusion that it would be best to explore developing new course registration application at the university.



Table of Contents

Executive Summary	i.
Introduction	1
Background and Context	2
Criteria	3
Overview of Alternatives	4
Methods	5
Results	6
Evaluation	12
Conclusion	14
Recommendation	15
Works Cited	16
Appendix	17



Introduction

The course registration application at Wayne State University is a vital tool for students. It streamlines a procedure that was once much more complicated. Even though the course registration application is improving upon the old pen paper method of registration, it's beginning to fall short now that new technologies and methods of registration exist. The current course registration application has become a common source of student frustration. As students at the university, we found it slow, difficult to use and lacking information. This is why we are exploring this issue and offer solutions in this report. We began by gathering student feedback through social media and a survey. After we completed this research, we found that students had many of the same issues that we had with with the current course registration application.

After reviewing our application as well as comparable course registration applications and examining student and faculty feedback, we have come up with a number of alternative solutions that we evaluate in this report. These include:

1. Develop a New Course Registration Application
2. Make Changes to the Current Course Registration Application
3. Purchase a New Course Registration Application

Once we explored each of these alternatives, we found that that the development of a new course registration application will benefit the university the most. Although, developing a new application can be expensive, therefore, we have come up with a solution that will reduce the cost of development, while also involving students in the development process.



Background and Context

The current course registration application is broken into two main components. The first component is Class Schedule, which allows students to browse and search for courses at the university and create a wish list of classes they want to take. The other component leverages a system called Banner which is used by students to register for courses. The class schedule application was developed at the university and is written using a number of programming languages which include PHP, ColdFusion and Javascript/jQuery. Banner is an application the university has purchased from Elucian and it is written in PL/SQL. The application was first implemented in 1999, making it almost 16 years old.



Criteria

We use two different sets of criteria to make evaluations in this report. The first set of criteria is used to evaluate the functionality of Wayne State's and other university's course registration applications. This criteria includes,

- **Speed**

This criteria evaluates the speed at which pages load, the speed at which we can search for and find courses and the speed at which we can develop a general schedule of courses.

- **Ease of Use**

This criteria evaluates how easily we could find the course registration application, the courses we want to register for and any additional information we require when registering for courses.

- **Design**

This criteria evaluates the visual appearance of the application and the ease at which we can find information relevant to course registration, including information about the course and the professor teaching the course.

The second set of criteria is used to evaluate each of the proposed solutions for the course registration application, which include,

- **Ease of Implementation**

This criteria evaluates the implementation difficulties that come with implementing the solution. This includes the technologies required, staff required and any additional challenges that may be encountered to implement the solution at the university.

- **Number of Concerns Addressed**

This criteria evaluates the number of student concerns that the solution addresses.

- **Cost**

This criteria evaluates the estimated cost of implementing the solution at the university.



Overview of Alternatives

1. Develop a New Course Registration Application

This alternative involves developing a new course registration application at the university. This will allow for all of the suggested modifications to be made to the course registration application and will also allow for new technologies to be utilized that will allow the course registration application to become faster and more available to students. This alternative will require current and possibly additional technical staff to develop. Implementation will also include training for students and faculty due to significant changes in the application for both parties. Development work can be given to students and supervised by technical staff at the university, similar to what Stanford University is doing to improve their course registration application.

2. Make Changes to the Current Course Registration Application

This alternative involves modifying the current course registration application to include a number of the suggested modifications where it is technically feasible. Due to the technical limitations of the current course registration application, such as the use of ColdFusion and PHP, some of the modifications may not be possible.

3. Purchase a New Course Registration Application

This alternative involves purchasing a new course registration application. There are a number of course registration applications currently available on the market. These applications may not contain all of the suggested modifications but could include some solutions that will improve the course registration experience. Since these course registration applications are more generic, they may require a significant amount of integration work to function well inside of the current university technical environment. This alternative may also incur significant cost, depending on the cost of the application along with the costs that come along with integration.



Methods

To gain insight into the current issues with course registration, we developed a number of questions that we wanted our research to answer. These include,

What are the primary sources of frustration for students attempting to register for classes?

What are the differences between Wayne State's course registration applications and the course registration application at other universities?

What are viable solutions that will improve the course registration experience at the university?

To answer these questions, we used the following methods,

Surveying Students

By surveying students we are able to obtain direct feedback from those who are most affected by the course registration application. Gathering data from students will allow us to represent the students better, since they are providing direct feedback on the issue of course registration.

Collecting Social Media

Students often voice their concerns via social media, therefore, it is a great source of student feedback. By exploring Wayne State's social media pages on Facebook and Twitter, we should be able to gather a number of concerns or complains students had about course registration.

Evaluating Course Registration Applications at Wayne State and Other Universities

By examining our course registration application as well as the the course registration applications at other universities using the criteria specified in this report, we are able to gather a number of different registration practices. This will allow us to see what other institutions are doing when it comes to course registration and also compare other applications to our own.

Interviewing Faculty

Since students are not the only ones affected by changes made to the course registration application, we surveyed a number of faculty members to provide their feedback on course registration. These include a professor, an advisor and the current maintainer of the course registration application.



Results

Student Feedback for the University's Current Course Scheduling Application

When surveying the students, we asked a number of questions that encompassed ease of use. These questions included the difficulty at which students had with registering for classes, getting overrides for classes and if they ran into any problems when registering. When it came to registering for classes, out of 56 students, 31 found it easy to register, 25 found it difficult. Out of 56 students, 39 agreed that it was difficult to obtain overrides, while 17 did not find it difficult. Lastly, out of 56 students, 29 did not run into problems with registration whereas 27 did run into problems with registration. From this, we can conclude that almost half of the students have some problem relating to course registration.

Upon reviewing social media on the University's social media pages on Facebook and Twitter pages, we found a number of complaints, especially on registration day, where the application was unavailable or not responsive for students.



Registration Applications at Other Institutions

Upon reviewing the course registration applications at other universities, we found a number of alternative methods for presenting course information and the process of registration itself. The universities that were reviewed include Stanford, Michigan State, Eastern Michigan, Western Michigan, Central Michigan and Alcorn State University. Each registration application has a unique aspect about it that sets it apart from the rest, with a few common features. Stanford, like no other researched, has its course registration and information application split into two separate sites (ExploreCourses and ExploreDegrees). This allows for course information and departmental information to be separated, thus allowing for faster and more intuitive navigation.

Another notable application is that of Central Michigan University's. They provide an application that you download to register for courses. Their application includes a real-time timetable of classes registered, which updates as courses are added and removed and which is also integrated into a visually appealing interface. The design principles help keep classes from becoming unintentionally overlapped, and the software is faster



than most web applications. The only downside is its inability to run on all operating systems. This application demonstrates that design, although a more basic part of application development, is one of the most important aspects of scheduling classes via computer applications.

Western Michigan University's registration system exhibits more failure than success in course registration and contains many of the issues Wayne State's application has. Not only is the layout cluttered with information (giving it an unprofessional look) but it also lacks in ease of use. There was no help in preventing overlapping classes and the search filter was basic with limited options.

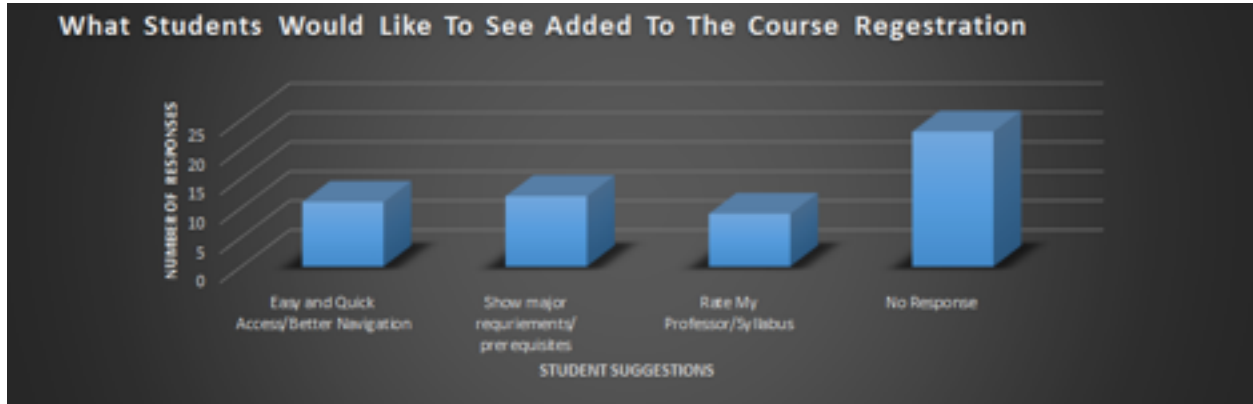
Eastern Michigan University is another example of a poorly structured system. It suffers from poor design and limited options to assist in registering for classes. One cannot pick specific times and days for their classes as an advanced search option, rather, it just displays the times available after a specific course is selected. It's the same with Alcorn State University, although, Alcorn utilizes more of the Banner software.

Michigan State, on the contrary, is easy to understand and up to date. One can select the building, time and day to meet each applicant's needs. It boasts a separate site for scheduling, spreading the load out between applications.

All of these systems have similar features, but the way they are presented is what sets them apart.



Suggested Changes to the Course Registration Application



After reviewing a number of applications and exploring student feedback, we found that the following concerns are the ones that most need to be addressed.

1. Application Availability on Registration Day

The course registration application receives a lot of traffic on registration day and is unavailable for students attempting to register. This is frustrating for students, especially if they have to spend a long time attempting to register for courses.

2. Professor Information

Currently, beyond the professors name, there is not much information about professors. This is leading students to use other resources, such as RateMyProfessor, which is an often unmoderated source of professor information. It often provides biased and misleading information about a professor based on only a few students' experience.

3. Better Navigation

The current application contains lists of courses and a lot of text. A new interface that is more modern would benefit the app greatly. Students should only see links that are relevant to them.

4. Faster and More Powerful Search

The current search tool in the course registration application is slow and has limited searching capabilities. The ability to filter courses by a specific time is not available and would be a beneficial addition. The ability to filter out courses based on major would also be a useful addition.

5. Degree Plan

The current course registration application only allows students to register for the upcoming semester. It would be beneficial for students to plan out their schedule in



advance and simply choose the sections they would like to attend once the information becomes available.

Integration Challenges

With the development of a new application or the purchase of a new application, a number of integration challenges arise. The first is integrating the application into the current technical environment at the university which encompasses a number of integrations. These integrations include providing new hardware for the application, providing access to other systems that include relevant student information and making sure the new application meets the university's security standards.

After interviewing some of the faculty and staff at the university, we found that they are open to changes but should be involved in the discussion of making these changes. Since certain features of a new course registration application will affect certain faculty procedures, training will need to be provided.



Evaluation

1. Develop a New Course Registration Application

- **Ease of Implementation**

This alternative has some implementation challenges which include training for students and faculty and developing new integrations that will give the application access to student data that the current application does not require.

- **Number of Concerns Addressed**

This alternative will address most of, if not all of the current concerns because the application can be planned and developed to address all of them.

- **Cost**

This alternative will incur the current cost of maintaining the course registration application, along with any development staff required to develop the application. If the option of using students is chosen, the cost will be reduced significantly.

2. Make Changes to the Current Course Registration Application

- **Ease of Implementation**

This alternative will have the least implementation challenges in terms of student and faculty training. Some training may be required where new stakeholder processes are developed, such as new features that streamline certain advising work.

- **Number of Concerns Addressed**

This alternative will address a number of student concerns where it is technically feasible. Due to the technical limitations of the current course registration application, it will be difficult to address all concerns.

- **Cost**

This alternative will have the same cost as the current course registration application. This is because the technical staff that is currently responsible for the course registration application can develop new features for the application while maintaining it.



3. Purchase a New Course Registration Application

- **Ease of Implementation**

This alternative may have a number of implementation challenges, depending on the product chose. Some integrations may already come with the product, that will allow for better implementation. Since this is a new product, student and faculty training will be required because the application will be different than the current one.

- **Number of Concerns Addressed**

This alternative will address a number of concerns but will be limited when addressing future concerns. The product may not allow for the development of additional features at the university, and will therefore be limited to the number of concerns that can be addressed.

- **Cost**

This alternative will incur a high cost based on the pricing for applications like this. Cost will also be incurred from the integration work that will need to be done to get the application working at the university.



Conclusion

In conclusion, we found that there are a number of concerns with the current course registration applications and that changes do need to be made to address these concerns. The course registration application is beginning to contribute to more student frustration and this could potentially contribute to retention issues in the future. Even though multiple alternatives are provided, we suggest exploring two, which we believe will provide the most benefit to the university. With student and faculty involvement in the process of incorporating fixes for the concerns addressed, Wayne State can expect a lot more approval from students and faculty, as well as streamline a number of procedures that are currently time consuming and difficult at times.



Recommendations

In conclusion, we suggest developing a new course registration application. Developing a new application at the university allows for the most coverage of student concerns addressed along with the ability to make changes when more concerns are raised in the future. Developing a new application make take time and be expensive, but if students are utilized in the development of the new application, the cost can be greatly reduced. The university will also have the option of selling this new registration application to other universities once developed.

Making changes to the current application is a feasible option and is a more efficient path for the university to take, but due to the technical limitations of the current application, it will become more difficult for concerns to be addressed in the future.



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Appendix

Interview with Professor (Dr. Jared Grogan)

q. How do you believe integrating a new course registration application will affect teachers?

a. Instructors will need to have this rolled out to them via different departments (in assemblies and in workshops). The Office of Teaching and Learning will need to be involved and they will need to prepare workshops and training materials.

Come to think of it.. They may want to provide feedback before it rolls out, especially if there is to me any connection with information about them, or if they will be required to update their faculty web-presence.

q. As a professor at the university, do you think it would benefit students to see reviews about you from the semesterly course evaluation?

a. Yes I do, but this will be up to the professor to share this information. There are privacy concerns and SET scores are to be highly contextualized. For instance, I get good scores, but I had a class of 9 students at 8 am, and one grouch can really anchor your scores. A friend who just won a teaching award also has a couple low scores because she missed a month of classes on Mat-leave, etc.

q. Would you like to have control over which reviews students can see?

a. Absolutely, and I think these should be part of a teaching portfolio, with sample assignments and student work. This of course would have to be encouraged and not mandated, as these things take time and are a part of professional development as a teacher in a rapidly changing school system.

q. Do you often get questions regarding registration, specifically, requesting more information about your course?

a. Way too often about overriding and about issues that I can't possibly know about, such as about whether or not they could/should take my course this semester. The scheduling system would do well to network very intelligently with advising. I am sometimes/rarely asked to give more information about my course... but I would like to be asked this more!!

q. Are there any other questions students address to you regarding registration for one of the courses you've taught?

a. No.



Interview with Advisor (Casey Rue)

q. Would you like to see the process for overrides streamlined? (For example, rather than having students email you details about which override they need, students could send an override request directly from the course registration application, which would include all the details you require for deciding on and granting an override.)

a. I think your proposal about an automatic email sent requesting an override is a fantastic one. It would surely cut a few steps out of the way the process is currently handled, and perhaps alleviate some of the frustrations on the part of students who get registration errors when they try to sign up for courses.

q. Do you often get asked questions regarding the description of course?

We actually don't get asked too much about course content. Since none of the academic advisors are Engineers, what we know about individual courses usually just comes with experience, and things we pick up on by speaking with students and faculty members. We usually just rely on the course descriptions that are published in the bulletin and handbook.

q. Do you often get asked questions regarding the order in which classes should be taken?

a. One of our most frequently asked questions deals with the order that classes are taken. This is especially so at the pre-professional level, when students are taking their math and science courses. One great example is Chemistry. Because there can potentially be two Chemistry classes that need to be taken (CHM 1040, 1225/1230), it is important for students to start Chem soon into their program. A lot has to do with pre/co reqs, as having CHM 1225/1230 completed is vital to take the BE 1300/1310 classes. The University makes each department publish a 4 year outline towards the degree (Civil's can be found in their handbook). While following this plan exactly usually is not viable, it can be good to get an idea about which courses should be taken earlier in the program, and which ones can wait towards the end.

q. Do you often get asked questions about which professor would be best for a specific course?

a. We do get asked about professors from time to time. However, I think that the majority of students would first do some research on their own. This would include speaking with friends and classmates that might have had a particular professor before, or by visiting websites such as ratemyprofessor.com.



q. Do you think students would find it beneficial to see the degree requirements directly in the course registration application, and perhaps even formulate a multi year plan towards their degree which you could advise on?

a. I think that being able to see degree requirements and formulate multi-semester or year plans of work will be made far easier by some new technology that Wayne State will be rolling out in the next months. This software, called DegreeWorks, will be replacing the STARS Plan of Work tool, and it will make it much easier for students to create plans of study, that they can then have confirmed with an advisor for accuracy.

q. Do you often get asked questions regarding the order in which classes should be taken?

Interview with Course Registration Creator and Maintainer (Jeff Dunn)

q. How do you collect and address student concerns with class schedule and course registration?

a. We typically get feedback from either the Registrar or our Marketing department. Marketing often monitors social media posts and forwards them to us right away - especially is a system problem has been identified.

q. Are there any major changes planned for class schedule or course registration that will address student concerns?

a. Yes. Our main focus is the issue where the online class schedule response time slows to a crawl under extreme load. This mostly happens when Winter registration opens at 7am. We had a trial run a few weeks ago when Fall 2015 Registration opened. We could see system response starting to degrade shortly after 7am - as expected. We then switched to our "Limited Function" mode, which is essentially a screen scraped version of the site. During the "Limited Function" mode, we improve response time dramatically by eliminating almost all database calls. We also remove costly (but useful, unfortunately) SEARCH functions during this time period.

Historically, this busy period occurs when we open registration (typically at 7AM) through about Noon-1pm. Possibly mid-afternoon. That pattern held true a few weeks ago. We were able to switch back to the full-function class schedule site without interruption around Noon. We did see some complaints for about a 10 minute time frame around 7am on Twitter - but they quickly went away once we switched to the Limited Mode. We had a couple of minor bugs that morning, but all of those have been identified and fixed.

So the plan is to use this Limited Function mode for the first day or Winter Registration.

We have also discussed plans to allow students to authenticate in to the class schedule site and save their wish list/shopping carts. Some of the code is ready to go, but we



have some other concerns we have to work through. Although this is very promising, we have not committed to implementing this feature yet.

q. Are there plans to integrate some advising tools (such as a tool to streamline overrides)?

a. None at the moment, but this is certainly possible if students are already authenticated into the class schedule. BUT - we do have to keep our eye on the new tools that are coming down to road from our student records core system (Banner) and other systems currently in development (like DegreeWorks). Some of these systems may have better ways to present the class schedule and interact with Registration. So we always look at those first before adding new functionality to our current system.

q. Which language(s) is/are utilized in the class schedule and course registration applications?

a. The primary languages for the current class schedule are ColdFusion, PHP, JQuery, Javascript. Registration is provided by Banner and the core language for Banner is PL/SQL

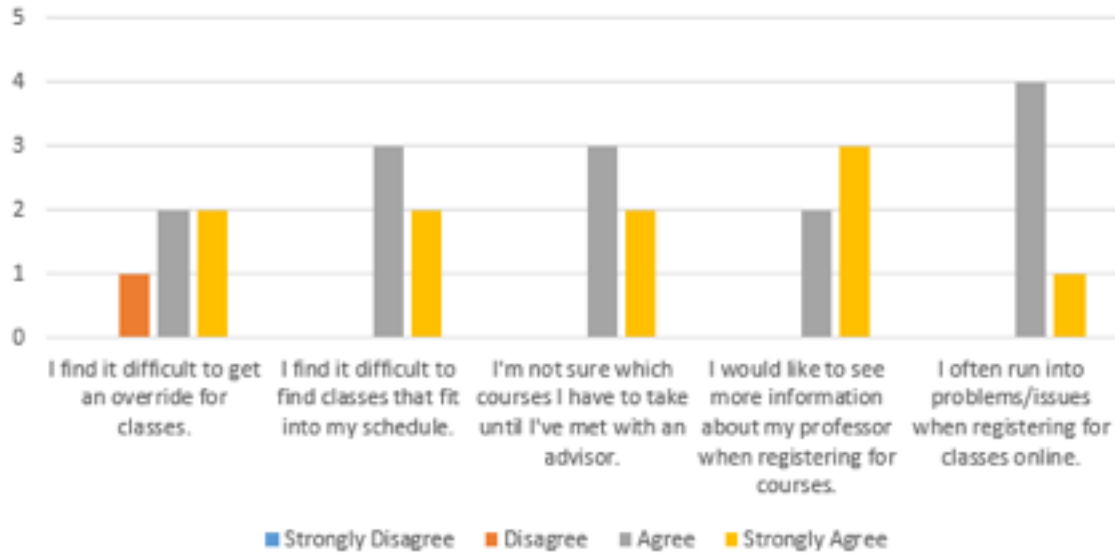
q. Roughly how long has the university been using the web based class schedule and course registration tools?

a. The current system was actually first implement by myself and a colleague back in 1999! That was pre-Banner. At that time, the University was producing pallets of printed class schedules.

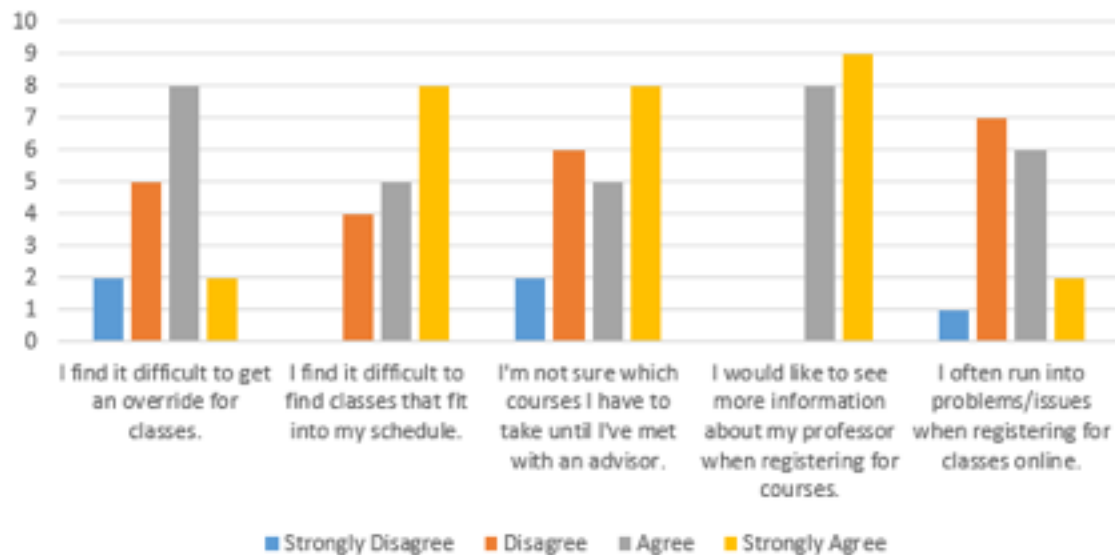


Additional Graphs of Survey Results

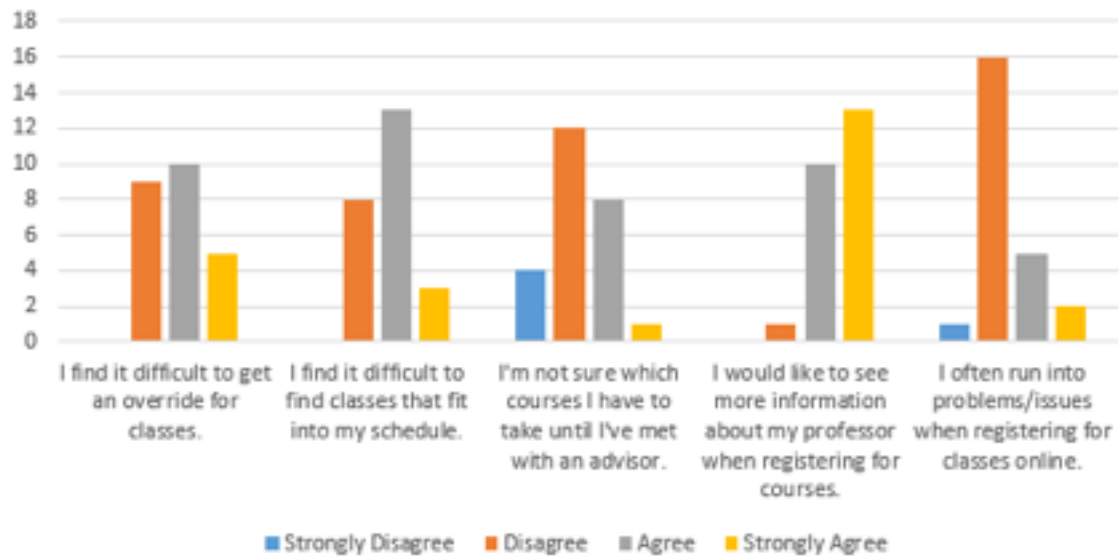
Senior Survey Results



Sophomore Survey Results



Junior Survey Results



Freshmen Survey Results

