**UNIVERSITY OF WATERLOO**
**Faculty of Science**

# *Evaluating the Effect of Math Centre Advertising Methods*

Math Centre - Humber College
Toronto, Ontario

prepared by

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2B Mathematical Physics
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April 21, 2016

Mr. Redsell-Montgomerie
Math Centre Co-ordinator
Humber College, North Campus
205 Humber College Boulevard
Toronto, ON M9W 5L7

Dear Mr. Redsell-Montgomerie,

I have prepared the enclosed report "Evaluating the Effect of Math Centre Advertising Methods" as my 2B Work Report for the Humber Math Centre. This report, the first of four work reports that Co-operative Education Program requires that I successfully complete as part of my Co-op BSc degree requirements, has not received previous academic credit.

As a Mathematics and Physics Resource Person in the Humber Math Centre at the North Campus, my main function was to tutor students in Mathematics and Physics related subjects. I was also able to assist with certain Math Centre Projects, such as the Solutions Folder Organization, a Mini-report, the SIRF research poster, and a Humber Admin iOS App.

The Faculty of Science requests that you evaluate this report for command of topic and technical content/analysis. Following your assessment, the report, together with your evaluation, will be submitted to the Science Undergraduate Office for evaluation on campus by qualified work report markers. The combined marks determine whether the report will receive credit and whether it will be considered for an award.

I give permission to the Math Centre to keep this report on file and use it for internal reporting and external reporting including publication. I would like to thank you for your assistance in preparing this document.

Sincerely,

Michael Gennari

Encl.

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# Executive Summary

The purpose of this report is to provide analysis of advertising methods employed by the Math Centre at Humber College, allowing the centre to better focus its effort on the more effective methods. The Math Centre has utilized a variety of advertising techniques ranging from posters, flyers, and social media to class visits, informing lecturers, and promoting social interaction between students. By using data from a SIRF study, the Math Centre advertising methods will be quantitatively ranked based on effectiveness. Several different groups of data will be compared.

Student awareness of the Math Centre was analyzed using campus-wide data. Based on the data collected by the SIRF study, employing lecturers as a form of advertisement for the centre provides the largest amount of student awareness, followed by fellow students, and finally by a student input category in which the largest factor was the Humber orientation event. These three forms of advertising are found to be the most effective forms of raising student awareness, while other methods such as Social Media and Flyers did not appear to be direct contributing factors.

Varying methods of advertising were analyzed in order to determine which form was most effective at bringing students to the centre. Given that a correlation is expected between student awareness and student visits, it is found that lecturers, fellow students, and the orientation event are the most effective manner for drawing students to the centre. It is also inferred that another category labelled Class Visits may indirectly contribute to the effectiveness of lecturers in bringing students to our centre.

# 1.0 Abstract

The Humber Math Centre is a free mathematics focused tutoring service for students attending Humber College, or Guelph-Humber University. Students come to the centre for drop in math help, sign in to our system, and one of the mathematics tutors will help them when they require assistance. Additionally, the Math Centre offers study spaces, can rent scientific calculators, can allow textbook borrowing, and work/review sheets for specific topics. Specific tutors are also able to assist with Physics and Engineering course material, as well as Programming and Software Development. Students can come to the Math Centre for several reasons, the primary one being guidance in mathematics coursework.

University of Waterloo co-ops are employed with the purpose of running the Math Centre. Co-op tutors have previous experience in the varying mathematics offered by courses at Humber and Guelph-Humber, and can thus tutor a diverse range of students, including the advanced upper year classes. In addition to this the co-op students handle other tasks including social media posts, class visits, producing Math Videos, completing reports, as well as many other administrative tasks. This report will summarize the advertising aspect of co-op responsibilities and their affect on Math Centre awareness and volume. This report will determine which methods of advertising are most effective as well as make suggestions for any new methods of advertising worth pursuing based on collected data.

In an attempt to determine the effectiveness of the Humber Math Centre as a student service, a campus-wide survey funded by the Staff Initiated Research Fund (SIRF) was conducted. The survey was conducted as part of the

Humber research project "Successful Strategies for Learning Centres" (*Redsell-Montgomerie, 2014*) project in the Fall semester of 2014. A random sample of 231 students completed the survey which included 103 questions on varying topics. Humber student data pertaining to the levels of awareness and use of the Math Centre has been collected by this survey. Specific topics that will be analyzed include whether or not the student visited the centre in addition to the source of their knowledge about the Math Centre. This report will focus on analysis of the data, which will allow us to determine which advertising methods, included under the Source of Knowledge information in the survey, were most effective at raising student awareness of the Math Centre as well as which method was most effective at drawing students into the centre.

# 2.0 Analysis

For all graphs/figures used in the following analysis section, see section 7.0 .

## 2.1 Effectiveness of Advertising

### 2.1.1 Math Centre Awareness

From the data collected by the Humber research project "Successful Strategies for Learning Centres", campus-wide levels of student awareness of the Math Centre were determined, in addition to some of the most common ways they came about knowledge of the Math Centre.

As shown by Figure 1 below, the greatest number of students become aware of the Math Centre through a referral from their lecturer, with approximately

41% of all students having been informed in this manner.

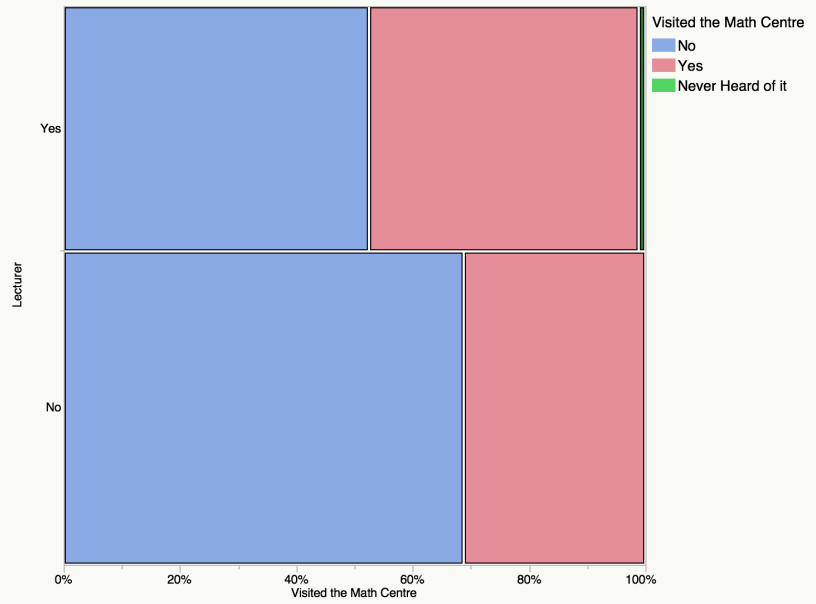


Figure 1: Lecturer versus Math Centre Visits

Given the relative contribution of lecturers to student awareness of the Math Centre, it is important that they increase concentration on promoting themselves to lecturers and members of staff. Class visits, which are another form of advertisement for students, should be expanded and refined so that they cater to the present lecturer as well.

The second largest contributor to student awareness of the Math Centre were fellow students. Data collected and shown in Figure 1 indicates that around 27% of all students surveyed were notified of the Math Centre by an individual from the student body. This data is visualized in Figure 2 shown below.

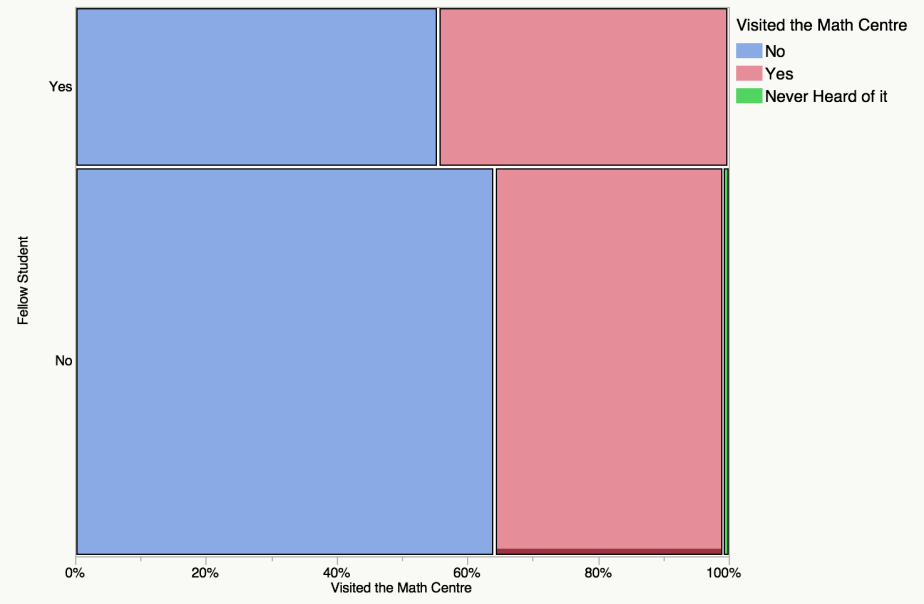


Figure 2: Fellow Students versus Math Centre Visits

Given that our two largest contributors to student awareness of the Math centre, being involved within the student and teacher bodies is essential in order to promote the Math Centre. The importance of the Fellow Students data will be expanded upon in section 2.1.2.

Interestingly, a notable amount of Math Centre awareness came from the survey category labeled as Other. Upon inspection of written student responses in Figure 3, it is found that the primary contributor to this section is the Humber orientation, with about 44% of students making mention of it. The Math Centre consistently participates at the Humber and Guelph Humber orientation, informing students about the types of services offered, our location, as well as social events hosted by the Math Centre throughout the term.

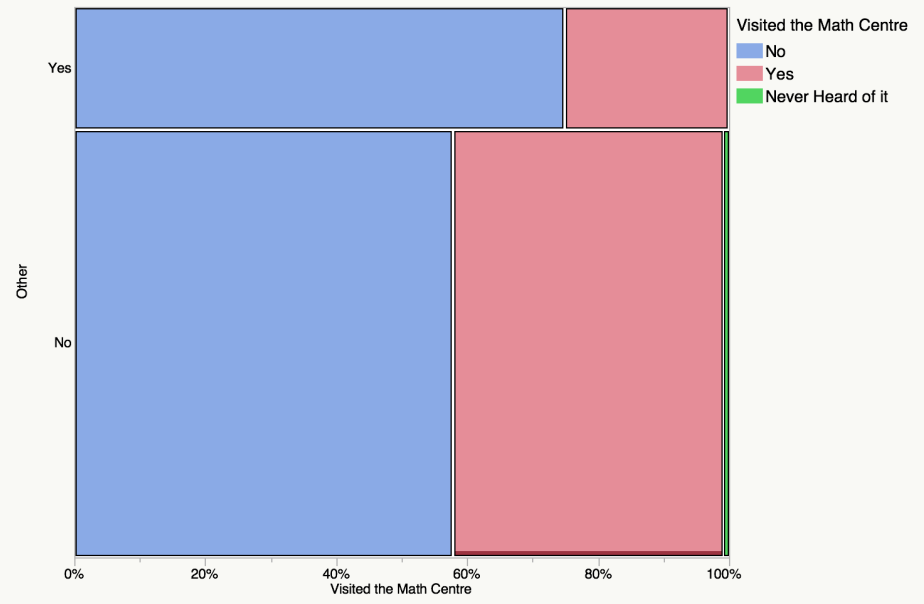


Figure 3: Other versus Math Centre Visits

From Figure 3, it is seen that while the effective number of visits caused by participating in events like Orientation is not as large as the previous two advertising methods, the student awareness (Not just those with a math course) caused by participating in these events is on par with that caused by fellow students and nearly as large as that caused by lecturers. This shows that participating in events like orientation are definitely worthwhile in terms of informing students and keeping them aware of our services. Events like this also connect the centre to other services within the College and University by building awareness with faculty members.

The results displayed above are significantly different from data collected by previous surveys. As shown in *Math Centre Survey Analysis (2013)*, the recommendations by teachers, fellow students, and performing class visits all contributed approximately equal shares (24%, 23%, and 20% respectively) to student awareness of the Math Centre. Current data however suggests that

these levels are much more spread and that class visits are no longer a leading factor in student awareness of the Math Centre, having been replaced by the Other category (41%, 27%, 21% respectively).

The other moderately effective forms of advertising included Class Visits, Posters, and School Email. However, the overall effect of raising awareness of the Math Centre with these techniques was not nearly as significant as the primary three advertising methods discussed above. Nevertheless, the significance of class visits is larger than shown by this pool of data, and will be explained in the following section. The most ineffective forms of advertising were Social Media, the Math Centre Website, and Flyers. While this is the case, this is not the primary function of the Math Centre website and social media as they serve a much different, more practical purpose in terms of data collection. The google search ability, review sheet access, and hours, and HeadStart.

### 2.1.2 Effectiveness of Drawing Students to the Centre

In addition to awareness levels, from the data collected by the Humber research project "Successful Strategies for Learning Centres" it is possible to generate an approximate understanding of the most effective Math Centre advertising techniques. The most effective techniques are those who not only made students aware of the math centre, but also caused those with math courses to seek out our centre. Note that for the following graphs, students who have no math related courses (No incentive to seek help in the Math Centre) were withheld from the data pool.

As stated in previous sections, it is clear that referrals/recommendations from

lecturers raises Math Centre awareness in the student body by the largest amount. When eliminating students with no math courses and focusing on those who have incentive to visit our centre, it is seen that the successful number of referrals from lecturers significantly increases. This can be seen in Figure 4 below.

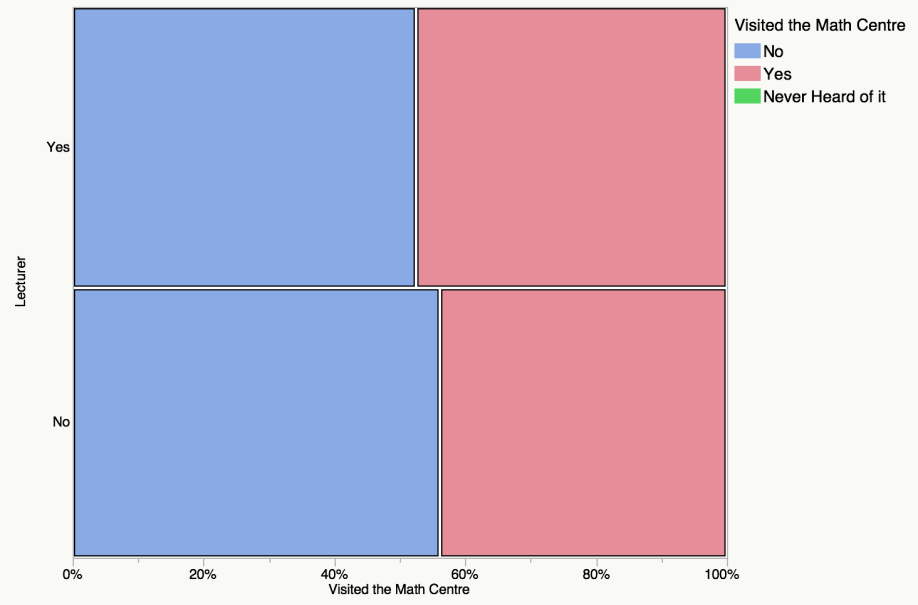


Figure 4: Lecturer versus Math Centre Visits (Students with Math Course)

So not only is the ratio of student awareness the highest when lecturers advertise our services, but the resultant volume increase within our centre, otherwise known as the ratio of students who visit the centre versus those who do not, is significantly higher than any other form of advertising attempted. For students with math courses, the ratio of students who visit our centre and heard about the centre from the lecturer is approximately 55% of all students surveyed. Based upon this, it is shown that being involved with lecturers and keeping them aware of the available services at the Math Centre is the most effective form of advertising in the Math Centre.

However, it is worth noting that while class visits contribute only moderately to the awareness and visit numbers in the Humber Math Centre, it can be inferred that there exists an overlap between this group of data and the group of data for lecturers contributing to our awareness and visit numbers. During class visits, the lecturer present will also attentively listen to our short discussion and interact with the presenter. This not only encourages the lecturer to forward students to our centre, but also keeps the lecturer actively aware of the varying services offered by the Math Centre, which in recent years has increased dramatically. These class visits are an excellent way of continually being involved with lecturers/faculty and keeping them informed about the Math Centre, thus leading us to draw the conclusion that our class visits not only draw students directly, but may influence the professor to individually promote the services of our centre. This could partially account for the large effect caused by lecturers as well as explain why class visits draw few students directly.

While lecturers lead in terms of awareness levels and student visits, a significant number of student visits were found to correlate with the large awareness caused by speaking with their fellow students. As shown in Figure 5, the grouping of fellow students exhibits a similar 50 percent split observed when lecturers referred students to our centre. However, even though the ratio is nearly identical, the magnitude of students visits and awareness of our centre is reduced.

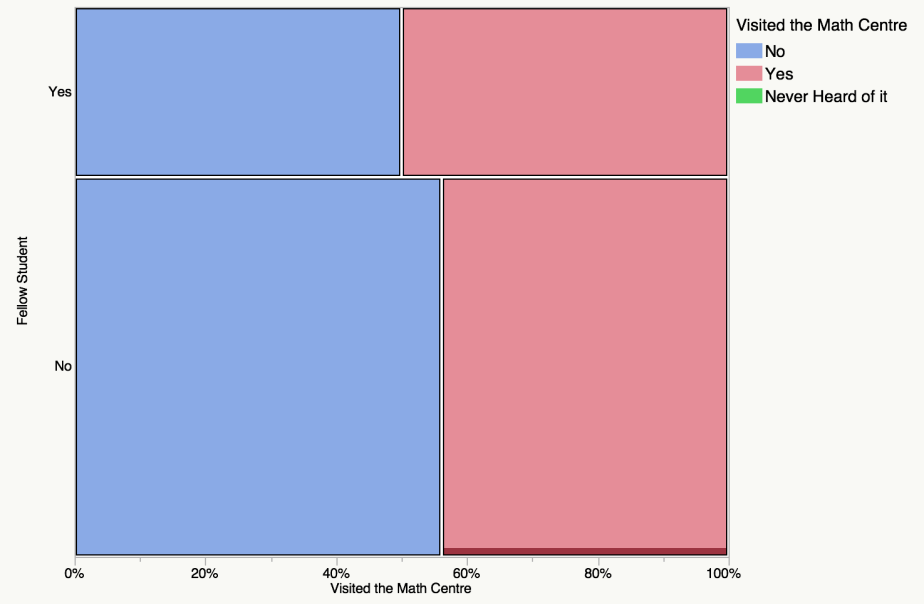


Figure 5: Fellow Students versus Math Centre Visits (Students with Math Course)

Since such a large portion of our visits being referrals from fellow students, it is extremely important that the centre focuses on customer service and proficiency in tutoring. Previous survey reports have noted that roughly 48% of students found the crowded nature of the Math Centre unfavourable and about 30% of students found the Math Centre noisy (Tharshika, 2013). The crowded nature of the Math Centre has been solved since its move to a new location, however noisiness within the Math Centre can still be considered an active issue. Moreover, should students complain about noisiness in the centre, tutors should move students who require quieter environments to the study rooms available to the centre. In order to improve the number of referrals from other students, it is essential that the Math Centre focus on creating an excellent customer service environment.

Considering it is expected that there should be a correlation between awareness

of the Math Centre and the number of visits seen in the centre due to the type of advertising, it follows that Class Visits, Posters, and the School Email were only moderately effective methods of bringing students into the centre. Similar to before, it is seen that Social Media, Websites, and Flyers were less effective (yet worthwhile) methods for bringing students into the centre.

## 3.0 Conclusions

By analyzing the survey data it is effectively demonstrated that there are correlations between student awareness of the Math Centre and the number of visits to the centre. While not every method of advertising showed this direct correlation, those with increasingly large data points followed the correlation in a more precise manner.

Additionally, it has been identified that the most effective forms of Math Centre advertising to be those which involve lecturers, fellow students, and other events such as the Humber orientation. This information was noticeably different from previous surveys conducted, allowing the Math Centre to identify and adjust focus and dedicated time to alternate methods of advertising.

# 4.0 Error Evaluation

There are several potential sources of error within this report. A factor which could contribute to error deals with the exclusion of students with no mathematics courses during the second part of our analysis. This was done to focus on students who would be targeted by our advertisements. However, while our primary functionality in the centre is to tutor for mathematics and related courses, there are students who enter the centre for non math course related help/activities. For example, the centre contains a chess table and Rubik's cube poster for students. These draw factors also connect students that may need help in the future, or have embedded math in a non math course. It is also found that many students enter the centre simply because they are curious about Mathematics. This may skew data slightly as students who are not enrolled in math courses but who may still be advertising our centre and raising awareness/visits are not included in certain portions of the data.

Additionally, the centre does receive a number of students for programming, physics, and engineering style courses who may consider themselves not enrolled in a math course, but still regularly utilize our facilities. Due to this, our data may be underestimating the total amount of awareness/visits considering these are omitted since they identify as in Non-Math courses.

These data collection issues could be corrected in the future by adding to the list of courses identified as math courses, or by simply by using the phrase "Math or Math Related Courses". This would better identify the number of students being targeted for advertisement by our centre, and would then increase accuracy of measurements made (Certain students eliminated from the data pool).

# 5.0 Recommendations

In accordance with the analysis, it is found that increasing interactions between the Humber Math Centre and staff at Humber (Notably lecturers) is one of the most prominent ways to increase exposure of the centre. Next to this, it is incredibly important that the centre focus on excellent service and tutoring given that a significant portion of our visits come from students informing other students of our services. Providing an excellent service can lead to positive reviews and may generate more student awareness for our centre. Given that the category "Other" has overtaken "Class Visits", importance should also be placed upon campus-wide events such as orientation. It is thus recommended that the centre focus its efforts on attempting to improve the way the current methods interact with the student body.

Additionally, a particular event which was not surveyed for would be games and movie night, hosted by the Math Centre. Considering the extent to which students who have previously visited the centre can influence the future number of visits (Fellow Students being one of the leading sources of knowledge), hosting social events such as the ones described above can generate a student-friendly atmosphere for the centre. These new methods of advertising should also be surveyed to a greater extent since these interactions with students may greatly increase campus-wide awareness for our centre.

It can be concluded that given the introduction of new advertising methods and the updated nature of the Humber Math Centre, new surveys should be conducted to improve the accuracy of previous results. Additional data would allow for determining more current ways to reach out to the student body and increase awareness/visits for the Math Centre.

# 6.0 References

Gnanachelvan, T. (2013). *Math Centre Surveys Analysis*. Humber College Math Centre. Humber College, Toronto, Ontario.

Hamilton, Mary. (2015). *Successful Strategies for Learning Centres - Survey Analysis of the Effectiveness of the Humber Math Centre in Improving Student Confidence*. Humber College Math Centre. Humber College, Toronto, Ontario.

J. Keah, Benjamin. (2014). *The Humber Lakeshore Math Centre Volume and Student-Tutor Ratio Analysis*. Humber College Math Centre. Humber College, Toronto, Ontario.

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# 7.0 Appendix

## 7.1 Graphs on Student Awareness

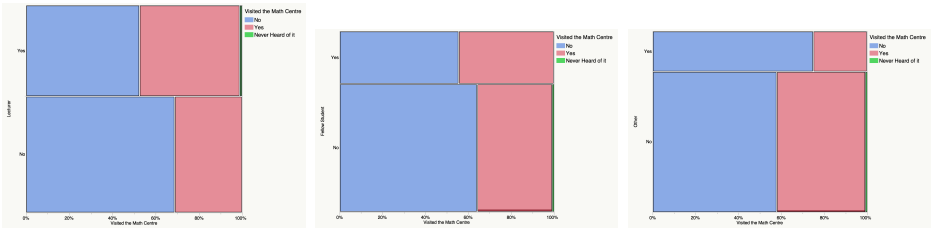


Figure 6: Most Effective Awareness Advertising

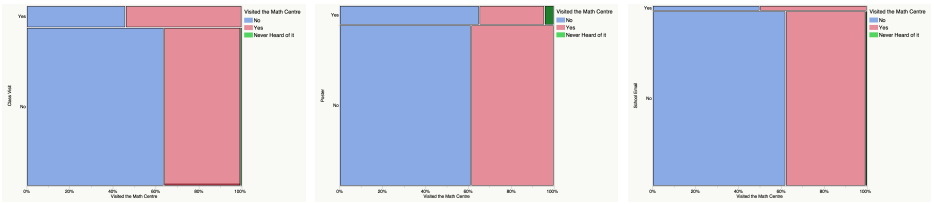


Figure 7: Moderately Effective Awareness Advertising

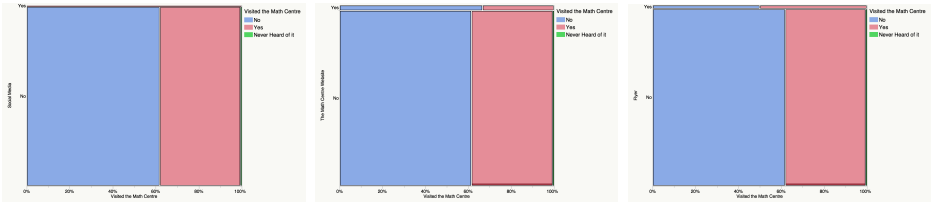


Figure 8: Ineffective Awareness Advertising

## 7.2 Graphs on Effectively Bringing In Students

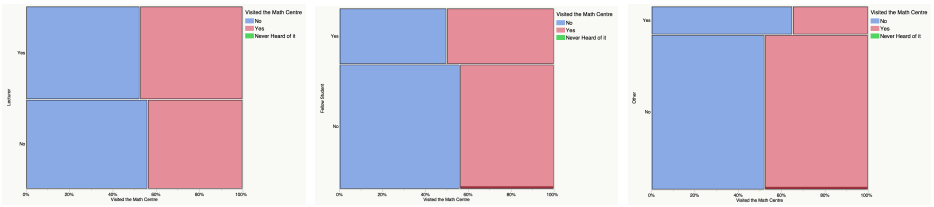

Figure 9: Most Effective Awareness to Visit Ratios

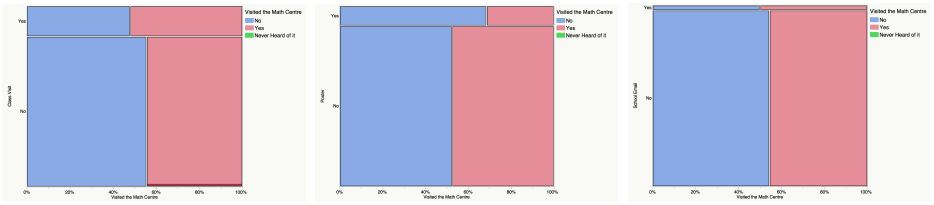

Figure 10: Moderately Effective Awareness to Visit Ratios

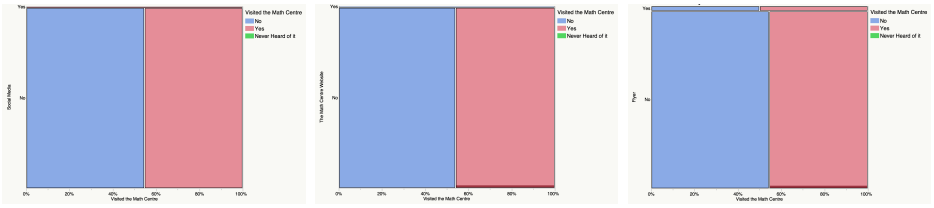

Figure 11: Ineffective Awareness to Visit Ratios