

# ACCEPTANCE OF SMS TEXT INFORMATION USAGE AMONG COLLEGE STUDENTS

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## ABSTRACT

Short Message Service (SMS) Text Messaging has become popular as mobile devices increased tremendously in recent years. The modes of communication in modern society have been redefined. Hence, this study was conducted to investigate and explore the usage of SMS text messaging as a notification service for reaching young adult students in a college environment. The questionnaire survey on INTI College students indicated a high acceptance of SMS usage and the preference of notification types or services. A few factors in SMS acceptance among college students were also suggested and discussed. Although confined to SMS text notification in one college, the results were also likely to be relevant to other colleges or tertiary institutions. The writers have also suggested six services that could be incorporated into SMS text notification to enhance the effectiveness and efficiency of communication in a college environment, and to ensure efficient dissemination of information for intended recipients.

## INTRODUCTION

Acceptance of Short Message Service (SMS) due to mobile penetration has been an important area of study recently in many countries. Of the estimated 576 million people reported to be using SMS, 256 million were in the Asia-Pacific Region, and 196 million were in Europe (McKenna, 2002). The highest mobile penetration recorded is in Europe, where the technology has reached a stage of maturity with 75 to 89% saturation

(Belhoul et al., 2003). In the UK alone, a rapid growth was shown in the adoption and usage of mobile phones, with an overall penetration of almost 70% in August 2001 (Barwise and Strong, 2002).

Approximately 52% of mobile phone users in Southeast Asia used SMS more than once a day, compared with a global average of 23 per cent (Anon., 2002a). In Singapore, over 50% of mobile phone callers used SMS more than once a day, according to a survey done by Cambridge University Business School. Meanwhile, Malaysian statistics showed approximately 3.5 million mobile users by the year 2002 (Anon., 2003).

Although voice is still the key medium, short message service (SMS) text messaging has also proved to be a huge success (Harvey, 2001). The global SMS usage from 1999 to 2002 has increased drastically from approximately 4 billion to 24 billion monthly (Belhoul et al., 2003). SMS Text Messages which were sent each day in the UK continued to grow every month. According to figures released by the Mobile Data Association (MDA), the figure has reached 71 million per day (Anon., 2004c). Sixty-eight percent of mobile phone owners said that they used SMS.

## SMS Usage according to Age Groups

Nonetheless, the percentage of usage varies by age group (Table 1). The younger age group of 14 to 24 years used SMS very frequently (over 90% usage). In another report by LG Mobile Phones Personal Call Survey, almost two thirds of Americans aged between 16 to 29 years of age

**Table 1.** Text Messaging Usage in the United Kingdom according to Age Groups (Barwise and Strong, 2002)

Age Group	SMS Usage (%)
14 - 15	97
16 - 17	94
18 - 24	93
25 - 34	81
35 - 44	74
45 - 54	50
55 - 64	38
65+	23

would choose a mobile phone ahead of a landline phone. (Anon., 2004a).

The volume of text messaging sent is also impressive with 81 percent of 18 to 24 year old mobile phone users sending at least one text message a day, and 31% of them sending at least five a day. A study conducted by Enpocket on 5,000 mobile phone users revealed that the degree of acceptance for SMS in advertising and marketing has reached more than 60 percent of respondents (Anon., 2002b).

### SMS Usage and Text Services

Text messages were used for a wide range of purposes such as intimate messages, work-

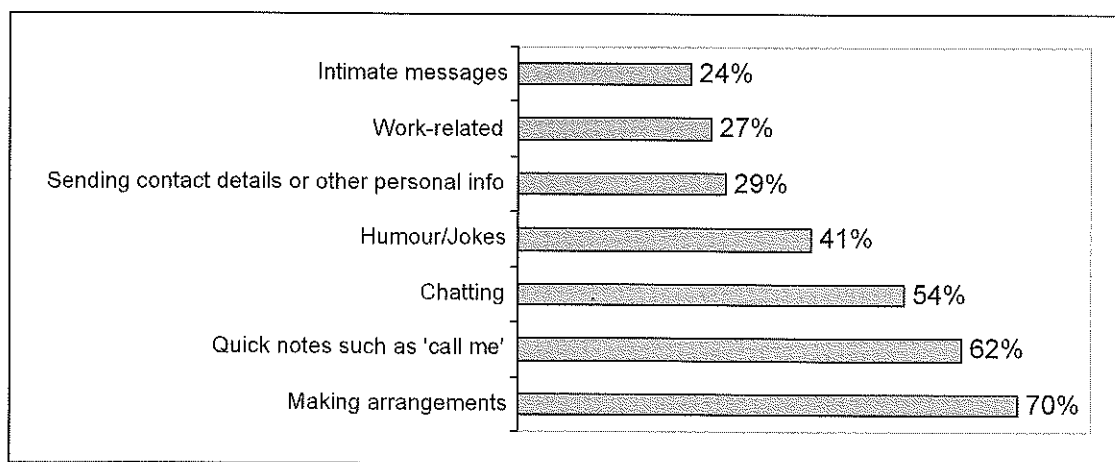
related messages, personal information, humour and so forth (Figure 1). Seventy percent of the text messages were concerned with marking arrangements.

SMS text messaging has four main uses: Discussion (35%), Entertainment (30%), Customisation (20%) and Information (15%) (Belhoul et al., 2003). As for information service, different users require different types of information. Examples of SMS-based information services currently available include travel updates, news alerts, stock alerts, sports updates, horoscopes, health information, event calendar and auctions. Most of these SMS information services are provided by telecommunication companies for the benefit of the public.

A generic classification of SMS text services was proposed by Intel Corporation. The services were (1) User-to-user Text Messaging, (2) Informational Messaging, (3) Notification Services, (4) Premium-based services and (5) Mobile Commerce (Anon., 2003a).

### Diffusion of Innovation

Since the 70s, the diffusion of the innovation theory was studied as a framework to analyze the factors that can account for the different

**Figure 1.** Types of Text Messages sent in the United Kingdom (Barwise and Strong, 2002)

adoption rates of mobile data applications across nations and countries, particularly in South Korea, Japan and the United States. Rogers' diffusion of innovation suggests that the successful adoption of new technologies will depend on five characteristics: the relative advantage, the reduction of uncertainty, the nature of the social system, the type of innovation-decision, and the communication channels (Rogers, 1962). Research also led to the development of a foundation in media and communication theory which was sought by adopters of different kinds of media (Blumler and Katz 1971).

Various criteria were evaluated on the user acceptance of information communications and technology (ICT), including those for mobile services as well as SMS text messaging services. The Technology Acceptance Model (TAM) by Davis focused on the attitudinal explanations of intention of using a specific technology or service (Davis, 1989; Davis et al., 1989). Meanwhile, Fishbein and Ajzen (1975) studied the behavioural attitudes, subjective norm, intention to use and actual use of ICT. As an extension to Fishbein's theory, Ajzen later (1991) worked on the theory of planned behaviour in relation to ICT. Among the variables used were age, gender, role, cognitive behaviour and technology usage.

The use of mobiles services, in particular, was evaluated using a set of qualitative and quantitative methods on teenage or adolescent users. Among the most penetrating studies are a set of qualitative studies done on Scandinavian adolescents and teenagers (e.g. Kaseniemi and Rautiainen 2002, Weilenmann and Larsson 2000, Ling and Yttri 2002). They showed that the use of mobile services was very good. Several studies also reported that young users were more "digitally capital" in using mobile services (Skog, 2002).

### **DART Approach**

Some models such as TAM (Technology

Acceptance Model) has also been taken into account the context of the Innovation Value and the Expenses (David, 1986). In 2002, the DART (An Acceptance Model for the Analysis and Design of Innovative Technologies) approach, an acceptance model which is especially designed for the analysis and evaluation of the user acceptance for mobile services, employed the fundamental design criteria including the applicability during the whole product lifecycle, a balanced consideration of relevant influencing factors, the use as a permanent controlling instrument and the adaptability to the individual requirements of a service (Amberg et al., 2002). Quantitative research was conducted among mobile users to assess their attitudes to SMS marketing in order to identify an SMS business model (Rettie and Brum, 2001).

Nonetheless, the existing approaches still are inadequate to analyze and evaluate the specific factors of innovative applications. Most of the existing models originally emerged from an ergonomic background where their users were employers (Amberg et al., 2002). Acceptance of users should be focused on a particular technology and analyzed based on a specific real life situation. This makes SMS acceptance among college students worth studying.

### **OBJECTIVES OF THIS STUDY**

The SMS information service concept can also be employed by colleges for information dissemination to students. Among college students, however, many factors may affect the acceptance of this service.

The study of acceptance is crucial for determining the level of user acceptance, criteria of acceptance, and the feasibility of implementing SMS services. Simon (2001) pointed out that the acceptance study means that users accept the innovation. Hence, acceptance study is a 'light-house' and colleges do not need to embark on the new application hastily without first achieving a significant level of acceptance. As part of a

preliminary investigation for the system development, a user acceptance study leads to an implementation model.

Therefore, a research project on the acceptance of SMS text notification was undertaken with the investigations conducted on INTI college students. Assuming SMS notification is a value added service without charges for student, this study aims to find the acceptance rate of SMS among students. The assumption on 'no charges' is important as most respondents only would like to try the services without costs. Pricing issues are rather complex and these strongly deter the acceptance factor (Andersson and Heinonen, 2002).

### Objectives

The objectives were:

1. To determine the acceptance of SMS text services among college students
2. To investigate the user preferences on the types of notification
3. To find out the effect of gender on acceptance of SMS text service
4. To determine the effect of the academic year on the acceptance of SMS text service

### MATERIALS AND METHODS

Since the potential users of the SMS service in this project were INTI College students, the respondents' age group was between 18 and 21 years of age. One hundred sets of questionnaires were distributed to respondents randomly in several locations such as hostels, computer laboratory, and side-walk café. However, only a total of 68 questionnaires were collected at the end of the survey. Based on a Statistical Sampling formula (Whitten *et al.*, 2001), the sample size of 68 should have the certainty of 90 percent.

Profiling information was collected during the questionnaire survey to facilitate the analysis on acceptance based on gender factor and academic year (Pre-University or Foundation year, and year 1 to 3 of the degree programmes).

Specific data collected included: (1) mobile use, (2) user of Wireless Messaging technologies, (3) type of Wireless Messaging technologies used, (4) frequency of using SMS text messaging, (5) acceptance of SMS Text service, and (f) types of notice preferred. For the gender and academic year analysis, each result was evaluated against the total in the respective category.

### RESULTS

#### Acceptance of SMS Text Services among College Students

A very high percentage (97%) of respondents owned mobile devices such as mobile phones and Personal Digital Assistants (PDAs) (Figure 2). Furthermore, 72.2% of respondents also used Wireless Application Protocol (WAP) technology with their mobile devices (Figure 3). College

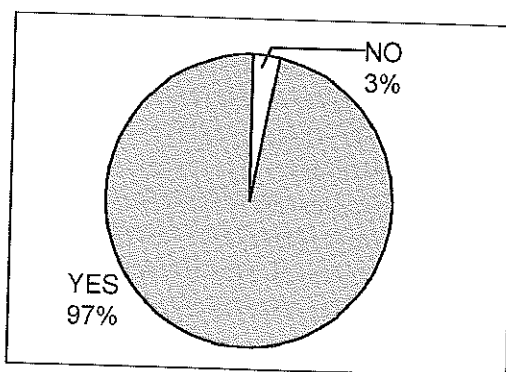


Figure 2. Percentage of respondents having mobile Devices

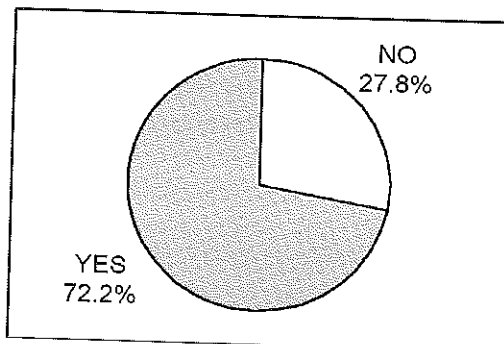


Figure 3. Percentage of respondents using WAP Technology

students (18 to 21 years old), were equipped with mobile devices and were users of WAP services, so that they could be easily connected to SMS technologies.

More detailed information was gathered and shown in Figure 4 on the types of WAP services used by respondents. A significantly high percentage (66.7%) was the SMS Text Messaging service from the Web server. This figure showed that not only college students were aware of WAP services, but a majority of them had experienced using SMS Text Messaging.

Most of them were frequent users of SMS as 33% send 3-5 messages per day, 31% send > 5 messages per day, and 24% send 1-2 messages per day (Figure 5). Only 12% of them did not send any messages in a day.

These results indicated that over 95% of college students were prepared to accept SMS text services. Moreover, the awareness and usage of SMS technology among them was as high as 65% and above.

In terms of acceptance of SMS Text Notification service for dissemination of college

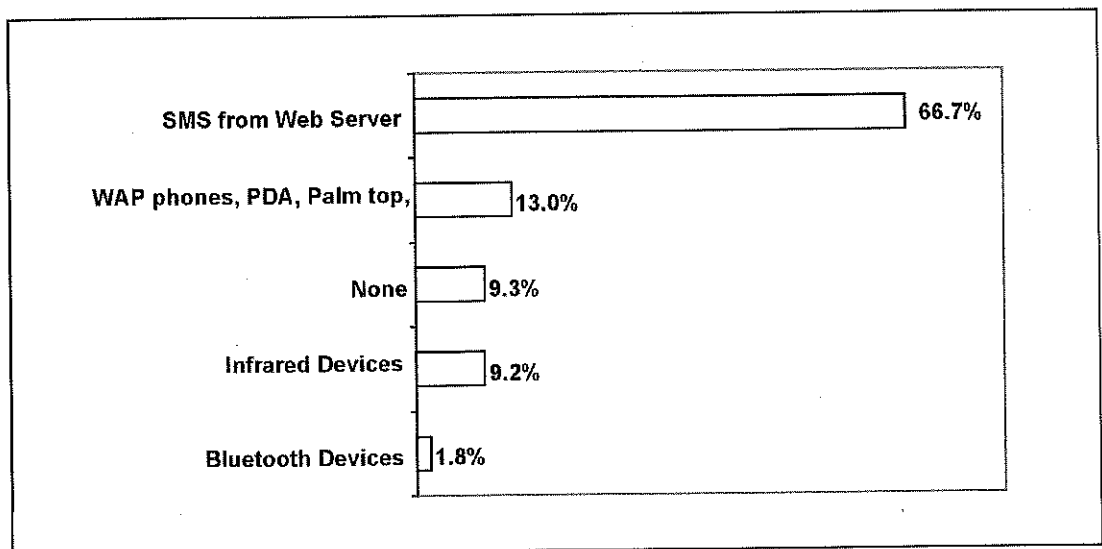


Figure 4. Types of services used by WAP users

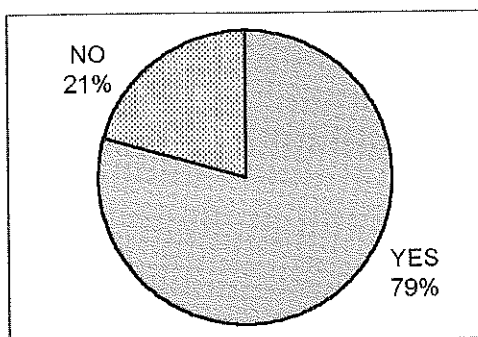


Figure 5. SMS usage among mobile device users in a day.

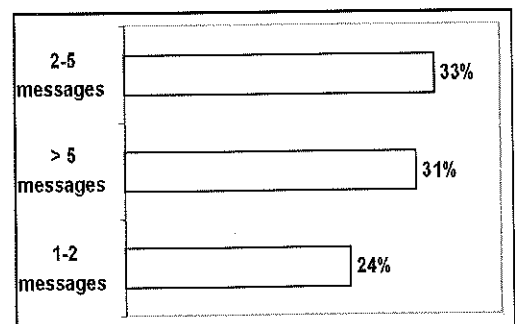


Figure 6. Percentage of respondents interested in SMS Text Notification service.

news, it was anticipated that 79% of the respondents would subscribe to it (Figure 6). This percentage showed a high level of acceptance on SMS Text notification system among college students.

### User Preferences on Types of Notification

Figure 7 shows that the most wanted SMS text notice was Personal Information (38%) which includes personal examination results. The second most preferred SMS text notice was Club/ Society related information, items for sale, and accommodation/ hostel events with the acceptance level of 20% each. INTIMA news (14%) and scholarship information (12%) were of the least preferred SMS notice. (INTIMA is the executive committee elected by the students in INTI College Malaysia).

In addition, a high percentage of respondents (68.5) also commented that they should be able to customize the SMS notice service. These young adult users wanted to be able to change and reselect the types of notice in an SMS notice system.

Moreover, they also preferred 'on-demand'

notification. Approximately one third of the respondents (31.5%) suggested that users should only receive notice after they had requested for it. From the survey, it was found that some respondents wanted additional information services such as their personal class timetables, coursework information, and school calendar. These notices could be classified under the Personal Information type of notification.

### Gender Impact on Acceptance

There were 37 male and 27 female respondents respectively. The percentage of male students who responded positively to SMS service was 86.5%; for female students, it was 77.8% (Figure 8). The difference between male and female acceptance is only 8.6%. Nevertheless, the frequency of SMS usage was reflected in Figure 9, with a higher percentage in males (91.4% of them sending 2 or more SMS per day) compared with females (only 66.6% sending 2 or more SMS per day). Generally, male respondents were the more frequent SMS service users.

Figure 10 shows the most wanted types of SMS notification for male and female students.

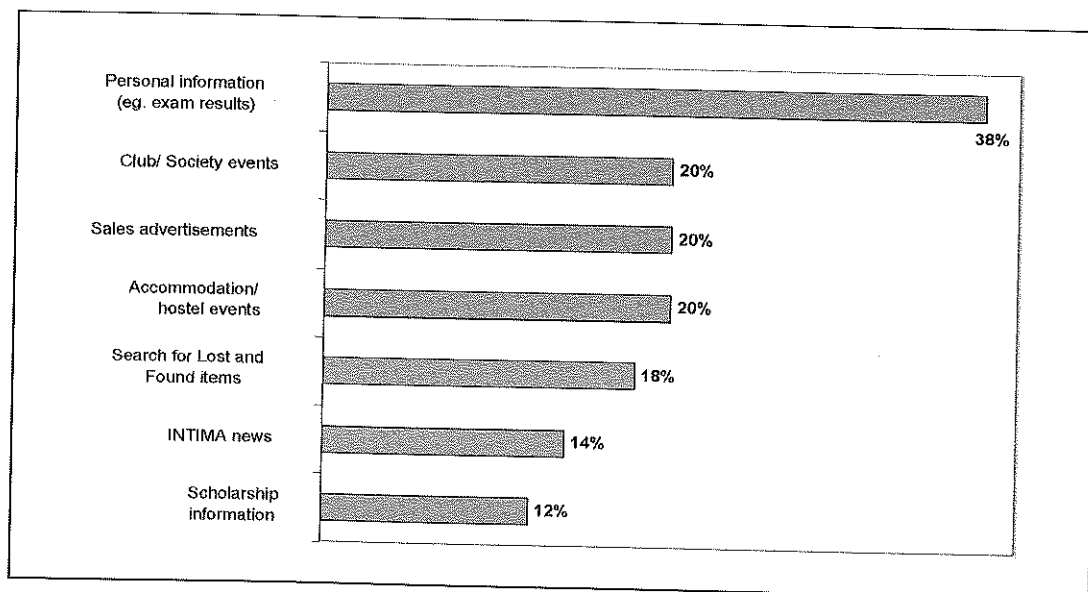
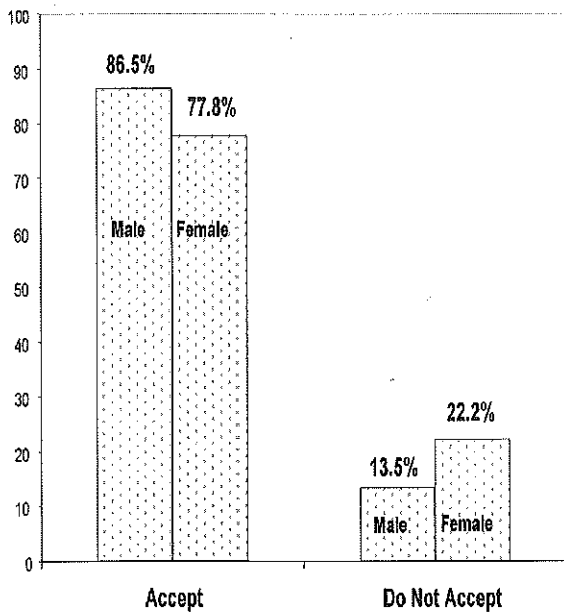
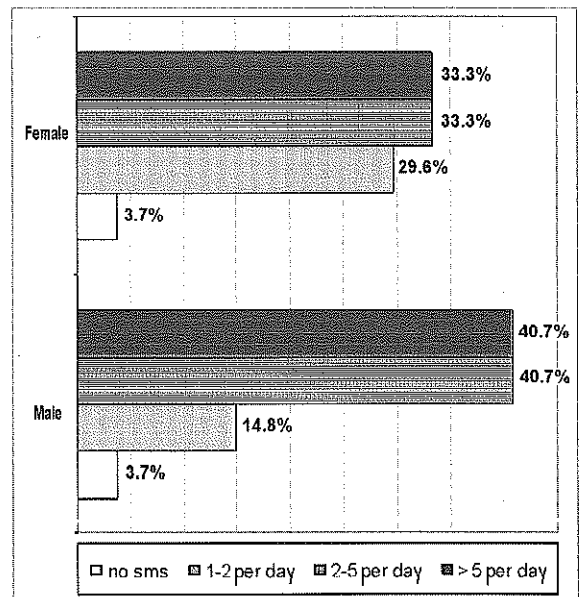


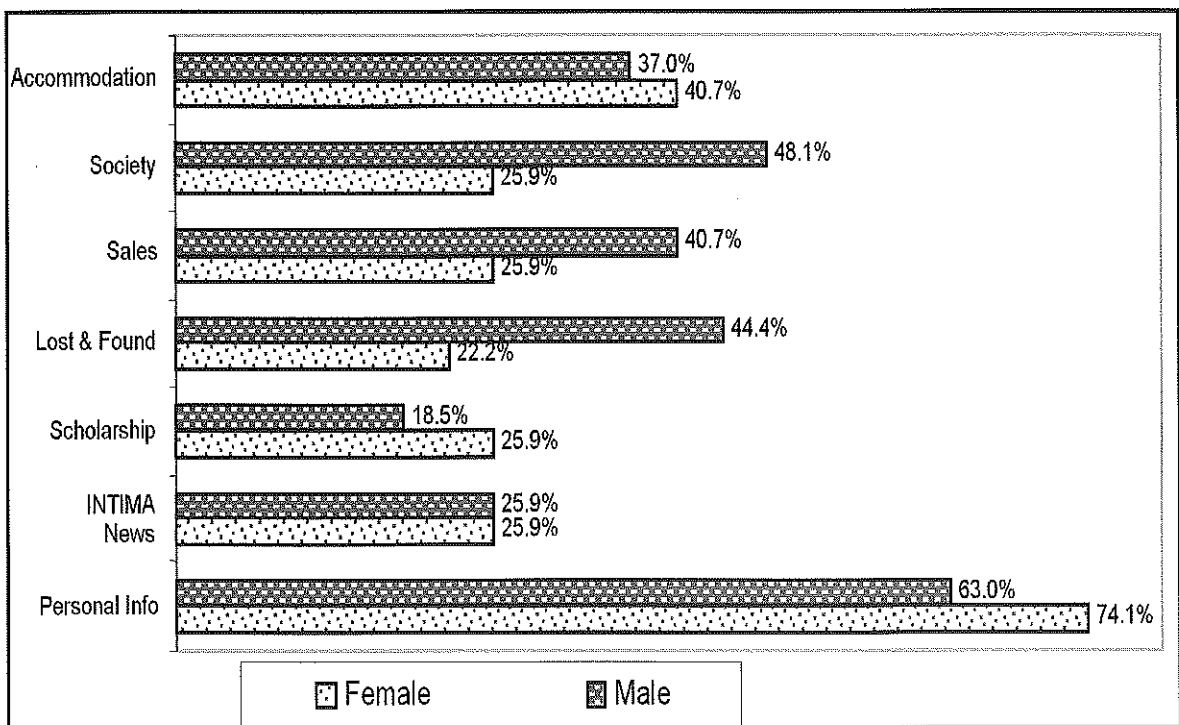
Figure 7. The types of notification preferred by respondents



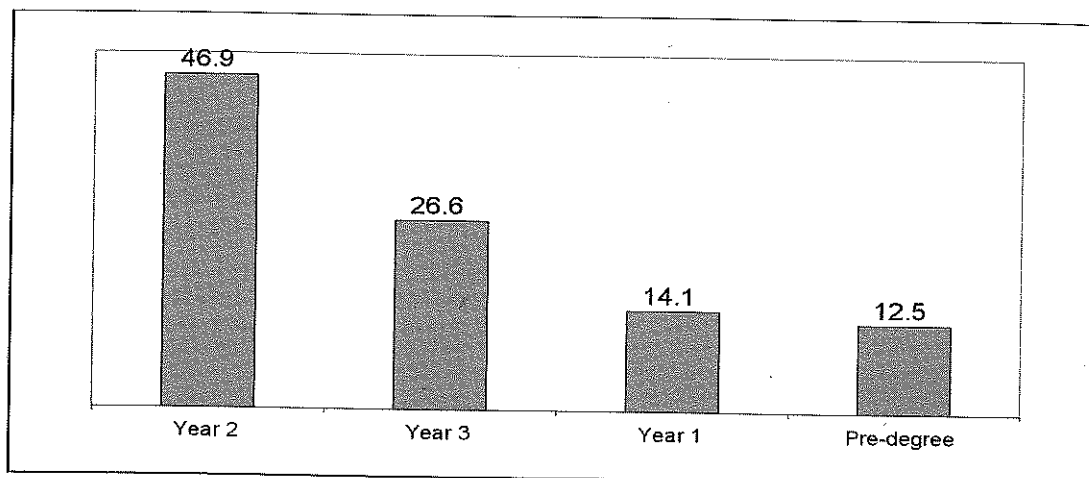
**Figure 8.** Acceptance of SMS Text Notification Service based on gender



**Figure 9.** SMS usage per day based on gender



**Figure 10.** Preferences for types of SMS notification based on gender



**Figure 11.** Percentage of respondents interested in SMS text notification for Pre-degree (Foundation) as year 1, 2 and 3 students of a degree programme.

Male respondents reported the highest percentage for Personal Information (63.0%), followed by Society News (48.1%) and Lost & Found (44.4%). Meanwhile, the lowest percentage was for the category of Scholarship News (18.5%). Female respondents also obtained the highest percentage for Personal Information (74.1%), Accommodation (37.0%), Society, Scholarship and INTIMA News (25.9% each).

The level of acceptance for each type of notification varied based on gender. Slightly more females wanted Personal Information (74.1%) compared with males (63.0%). As for INTIMA News notification, there was no difference between male and female preferences. In Scholarship notification, the percentage of female acceptance (25.9%) was also higher than the male's (18.5%). However, male respondents seemed to be more interested with Lost & Found, Sales, and Society notification due to the 'extra' percentage of 22.2%, 14.8% and 22.2% respectively. Slightly more females (40.7%) wanted 'Accommodation notice' compared with males (37.3%). Both genders had similar patterns in accepting the type of notice except for Lost & Found, Sales and Society Notices. More female respondents were interested in these types of notices compared to their male counterparts.

### Effect of Academic Year on Acceptance

Based on the academic year, students in Year 2 of their degree programmes had the highest percentage (46.9) in accepting SMS text notification services. This number is almost half of the total respondents. Pre-degree (i.e. Foundation Year) and Year 1 students scored the lowest percentage in accepting this kind of service (Figure 11).

The usage of SMS text among students varies among different academic year groups. A higher percentage of Year 2 and pre-degree students send more than 5 SMS per day compared to students in year 1 and year 3 (Figure 12).

Figure 13 shows that 62.5% of Foundation Year students used the SMS to secure accommodation while 37.5% used it to find out more about the college's societies which offered sports and holistic education. Degree students at Year 1, 2 and 3 used SMS for activities related to accommodation, society, sales and so forth.

### DISCUSSION

SMS service usage was very high among college students in a study environment because a high percentage (97%) of respondents of this survey own personal mobile hand-phones. Even though



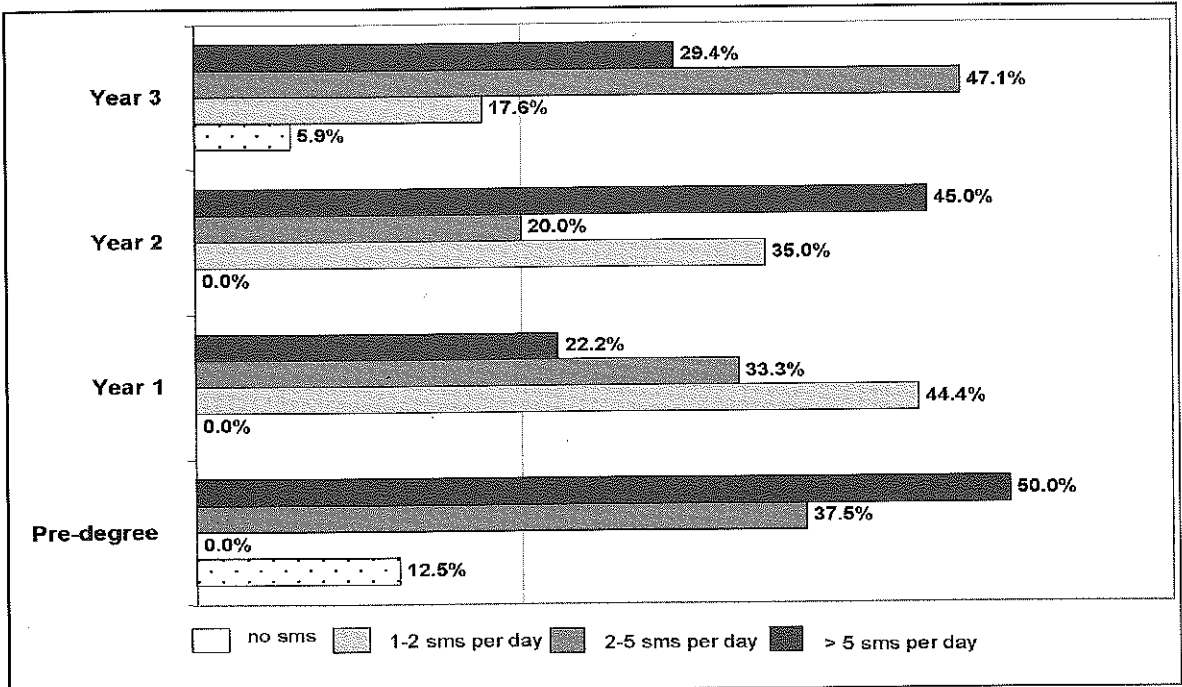


Figure 12. SMS text messaging usage for Pre-degree, and year 1, 2 and 3 students of a degree programme.

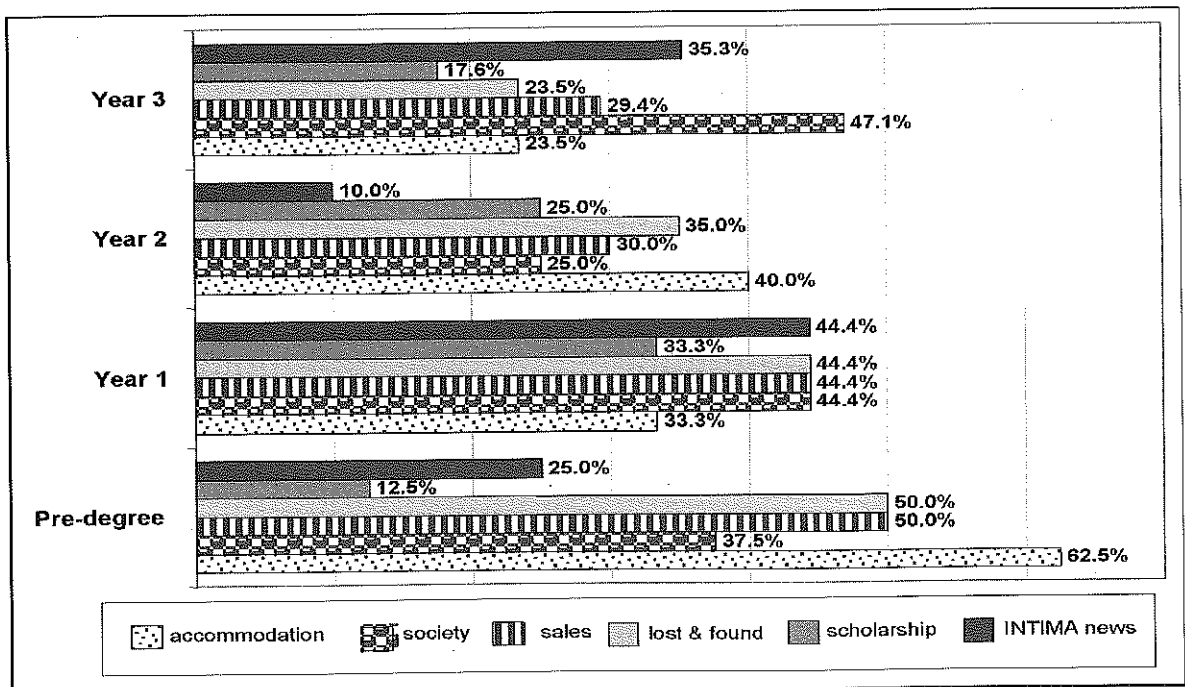


Figure 13. Types of preferred SMS notification for Pre-degree and Year 1, 2 and 3 students

many WAP services are available in the market, 66% of respondents showed preferences for SMS services. This indicates that many respondents favoured SMS services (particularly Text Messaging) for communication and close contacts with friends, relatives or family members.

The mobile phone users sent at least one SMS a day. More than half would make use of the service for more than 2 times a day. A high number of mobile users depend on SMS service for daily communication. As such, any application which employs SMS services would definitely be feasible or viable for mobile users.

As for the type of information, 38% of mobile users preferred personal information (such as notification of examination results) in a SMS notification alert service. The next favourable information types were Social Events, Sales Advertisement and Hostel/Accommodation events (20% each). Although personal information is highly preferred, it was not requested frequently. Other types of information, though not so favoured but requested daily, could also be capitalised in the planning of providing SMS services to college students.

From the survey, the impact of gender on SMS services acceptance among users was as low as 8.6%. The total number of male and female respondents for each category, though not an adequate number for building solid conclusion, did give some indication. The suggestion from this result was that gender did not have a major impact on the acceptance of the service. All users, regardless of their gender, used the service for communication at almost the same intensity. Nonetheless, many studies have found that males and females responded differently on SMS text messaging in terms of the role of using (Kaseniemi and Rautiainen, 2002), way of expression (Skog, 2002) and social network (Ling and Yttri, 2002). For example, Skog (2002) observed that girls valued the social functionality of the mobile phone higher than boys, who on

the other hand, stressed the technical functionality.

The pattern from the survey revealed an increase in SMS text notification services acceptance based on the ascending level in the academic year of study (Figure 11). Meanwhile, within each academic year, the frequency of SMS usage did not follow the earlier pattern and provided a contrasting phenomenon (Figure 12). A higher percentage of frequent users (who sent more than 5 SMS a day) came from those in pre-degree programmes (50%). This was based on the assumption that students at higher levels of the academic year would most probably accept SMS services, while those in lower level of the year were the ones who practically exploited the service.

However, the increasing rate of technological change is coupled with socio-economic, political and competitive factors that confuse users and divert their acceptance (Turnbull, Leek and Ying, 2000). Hence, the continuous increase in mobile penetration, and technological advancement would definitely change user acceptance on SMS text messaging services. Furthermore, factors influencing user acceptance include cultural factors across countries and nations (Lee and Kim, 2003).

Based on facts gathered from the survey results, that SMS service is currently well accepted among young adults in their college ages; the college management and administrators should consider seriously in providing wireless SMS services.

The authors recommend that the following services be established to facilitate communication amongst students currently in the college system, potential students and even the public:

1. Message Notification alert with services such as examination results, enrollment fees, latest news in the college and other news or messages for current students

2. Incorporation of the online e-learning portal to automate email alert messages to the subscribed users
3. Portal to allow public access for enquiries of information such as general information, and the courses with the appropriate information
4. VXML (Voice Extensible Markup Language) server which enables the users to obtain information pertaining to the college and the academic programmes
5. Portal for the submission of student grievances and complaints
6. Portal that allows a centralised communication chat room for current students as well as college graduates

In general, messaging services will be the most efficient for communication and formal messages. Comparing different messaging services, such as email, instant messaging and text messaging, SMS text messaging is mainly different when it comes to interactivity and length of message (Te'eni, 2001). Te'eni (2001) also suggested that the higher interactivity will lead to shorter messages. Furthermore, a study by the Radicati Group claimed that e-mail wireless usage among employees increased productivity (Anon., 2004b). Hence, SMS text messaging would be most suitable for achieving a high degree of interactivity, and at the same time, effective communication between providers and users.

#### FUTURE RESEARCH

A more extensive study will be conducted in future on the types of notice preferences, gender, academic year, and the significant correlations among them. The interpretation of results could be achieved by incorporating a larger sample size. An acceptance model with all possible factors could be constructed. The study would also be extended across campuses, and if possible, across countries for a more comprehensive comparison.

#### CONCLUSION

The rapid growing trend of SMS usage among college students makes it imperative that we develop these services to enhance communication among various parties in the college environment, i.e. management, administrators, general public, students, and so forth. With the proposed services by means of SMS Text Messaging, the college management and administrators would definitely witness the efficiency of information dissemination for intended recipients.

This study has clearly indicated a high level of acceptance of SMS text messaging among college students in this country. The types of SMS text services are personal information, accommodation/hostel news, students activities news (clubs and societies), and sales advertisements. The SMS applications should be designed to disseminate these main types of text notices as the core functions. Other related features could then be added as supporting functions. SMS text services and types of notices should be provided to all students, regardless of their academic year level and gender. For a pilot project, students from the foundation programme or Year 1 of the degree programme could be selected.

Nevertheless, the assumption on free service has some impact on the usage of SMS text information; the approximate cost varies from RM0.05 to RM2.00 per message. It must be noted that if there is a charge on SMS text information by the college, the percentage of students using this service would be lower.

A careful implementation of such enhanced communication services would ensure higher customer satisfaction, efficiency in information dissemination, a better corporate image and perhaps more revenue for participating colleges. Hence, it is worthwhile investing financially in the SMS system.

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