THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

Determinants Of Satisfaction Of Mobile Phone Keypad And Keypad Design Factors In Short Message Service Usage

Isaac Yaw Deh
Marketing Department, Sunyani Polytechnic, Ghana
Nicholas Appiah
Marketing Department, Sunyani Polytechnic, Ghana
Richard Denanyoh
Marketing Department, Sunyani Polytechnic, Ghana

Abstract:
The study aimed to contribute to the literature by examining the role of hand features in the preference and satisfaction of keypad design factors in a quantitative, descriptive and cross-sectional survey of 255 respondents selected through convenience sampling methods of marketing department. Primary data were collected using self-design questionnaire, administered during lecture hours. Cross-tabulation was used to analyse data for percentages, frequencies for descriptive results. Chi-square was for the assessment of the relationship between hand features and preference for keypad size and satisfaction of keypad design factors. There was significant difference between hand features and preferences for keypad design factors and satisfaction of keypad design factors. The findings should be incorporated in the production strategies of mobile phone designers and marketers. Future studies should examine the role of demographic in the preference and satisfaction of keypad design factors.

Key words: Simplicity of keypad use; space between keypad; layout; hand size; hand breath
Jel Classification: O14; L63

1.Introduction

Since the introduction of Short Message Service (SMS) in economies for communication through non-vocally method, many users of mobile phones with various demographic factors have been using the SMS to express themselves in all economies (Ng et al., 2010; Balakrishnan & Yeow, 2007). The use of SMS is based on the use of combinations of characters which are alphanumerical in nature with a maximum of one hundred and sixty characters (Balakrishnan & Yeow, 2007).

The use of SMS by people and the benefits of the usage have been well researched by researchers. SMS is used for various reasons as identified in the literature in previous research (Barkhuus, 2005; Faulkner & Culwin, 2005; Reid & Reid, 2004; Oksman & Rautiainen, 2003; Grinter & Eldridge, 2001; Ling, 2001). Among the various reasons of SMS usage is to overcome shyness, maintain relationships and adjust meeting times.

Mobile phones come with different keypad designs for dialing numbers. Some users consider some of the designs as not appropriate for texting or makes texting difficult. Some digits are for multiple purposes and the use will need to make multiple key presses for indented purpose. For example the digit '6' is used for 'M', 'N' and 'O' (Balakrishnan & Yeow, 2007).

Empirical studies on keypad designs are found in the works of researchers such as Balakrishnan and Yeow (2007), Kurniawan et al. (2006), Ornella and Stephanie (2006), Soriano et al.(2005), Wigdor and Balakrishnan (2004), Cockburn & Siresena (2003), Mackenzie (2002), Maragoudakis et al.(2002), Silfverberg et al. (2000) and Ward et al. (2000).

The studies report various problems of keypads such as trade-off between the increased performances of advanced input technologies and their additional cost, tiny sizes of keys and keys that are placed too close to one another. These features according to users make handling of mobile phone difficult.

Various variables such as Hand-size, thumb length, hand breath, hand circumference and mobile phone dimensions (key size, shape, layout, texture, simplicity and space between keys) have been identified to influence the satisfaction of the use of mobile phone and SMS.

The findings are found in the works of researcher such as Balakrishnan and Yeow (2007), Faulkner and Culwin (2005), Ling (2005), Nysveen et al. (2005), Reid and Reid (2004), Kwon & Chidambaram (2000). The findings on gender are not conclusive in the literature.

The paper is based on the theory of satisfaction. Satisfaction is defined according to Lévy-Garboua et al. (2007) as 'satisfaction and dissatisfaction' as a measure of pleasure and pain. Consumers of products express their opinions on the dissatisfaction and satisfaction towards a product or service they purchase for various reasons including mobile phones.

According to Lévy-Garboua et al. (2007) satisfaction 'is not an ex ante measure of the utility, but measures an ex post latent preference for the choice made. It is an experienced utility or related to ex post utility. After the outcome of the consumer's choice, the consumer is either satisfied with the choice or dissatisfied.

The expression is done either after the purchase of the product when the product is compared to other product (reference dependence of satisfaction) or after the usage of the product (Diener et al., 1999). In the paper the satisfaction of the features of mobile phone features is examined in an ex-ante and ex-post latent preference for mobile phones.

1.1.Statement Of Problem/Justification/Significance
In recent times there are many mobile phones on Ghanaian markets with different features (key size, shape, layout, texture, simplicity and space between keys) which attract consumers differently. The empirical examination of consumer satisfaction of a product is essential in the determination of the propensity to repurchase a product the consumer purchases before (Lévy-Garboua et al., 2007). In view of this, the paper examined the consumer satisfaction level in relation to the effect of hand features on keypad design factors.
Lots of empirical studies have been done on the uses of SMS among various users in various economies but few works exist on the satisfaction of users of SMS in relation to Keypad design (Balakrishnan & Yeow, 2007; Yun et al. 2003; Han et al. 2004). In the knowledge of the researchers no such empirical works exist in the literature on the study area. The current paper fills in the literature gap.
The findings of the research provide reference material for future researchers in similar study context. The findings also provide a policy guide to manufacturers and designers of mobile phones on the design of mobile phone to meet the expectations of consumers.

1.2.General Objectives/Specific Objectives
The objective of the paper is to contribute to the body of knowledge in literature in the area of mobile phone design by examining customer satisfaction with the keypad design factors. Specifically the paper among other things examines the role of hand features in the satisfaction of keypad design factors in sending SMS.

1.3.Research Questions And Assumptions
The paper is based on the research questions which are:
- Which mobile phone features consumers are satisfied with most and why?
- What is the link between hand features and keypad design factors?
The assumption underlying the paper is that hand features of consumers influence their satisfaction with keypad design factors.

1.4.Limitations And Scope Of The Paper
The findings of the study and the interpretations of the findings are limited to the use of self-reported responses of respondents in the study. Areas of respondents bias might not been known by the researchers. The uses of mobile phones are not examined in the study. The link between demographic variables and keypad design factors are not examined in the current study. Data is collected only the marketing departments of the school and not other department.

2.Research Methodology
The paper is based on quantitative, descriptive, cross-sectional survey of 255 respondents selected through convenience sample method. The students of marketing department are the respondents of the survey. Primary data (responses to questions asked) were collected using a questionnaire which was self-designed by the researchers and administered during lecture hours. The data collected was analysed using cross-tabulations for frequencies, percentages for descriptive results and Chi-square for the inferential statistics. Results were presented in tables.

3.Results And Discussion
The results are presented and discussed in this section of the paper. The demographic profiles of the respondents in the survey are presented first. This is followed with the results on the link between the hand features and keypad design factors.

3.1.Sample Characteristics
Majority of the respondents in the survey were males 182(71.4%) and the age distribution indicates that majority 159(62.4%) respondent's falls in the age group of 23-27. Most 114(44.7%) of the respondents are from Ashanti region. The results are shown in Table 1.

Demographic Variables	Frequency	Percentage
Gender		
Male	182	71.4
Female	72	28.2
Missing response	1	0.4
Total	255	100.0

Age		
18-22	69	27.1
23-27	159	62.4
28-32	21	8.2
Missing response	6	2.4
Total	255	100.0
Region		
Western	8	3.1
Volta	4	1.6
Eastern	17	6.7
Brong Ahafo	63	24.7
Ashanti	114	44.7
Central	7	2.7
Greater Accra	13	5.1
Northern region	7	2.7
Upper west	14	5.5
Upper east	7	2.7
Missing response	1	0.4
Total	255	100.0
Father educational level		
No post secondary education	50	19.6
Post secondary	70	27.5
Tertiary	134	52.5
Missing responses	1	0.4
Total	255	100.0
Mother educational level		
No post secondary education	97	38.0
Post secondary	87	34.1
Tertiary	70	27.5
Missing responses	1	0.4
Total	255	100.0
Religion		
No religion	6	2.4
Christians	225	88.2
Muslims	15	5.9
Missing responses	9	3.5
Total	255	100.0
Family Income		
Low	20	7.8
High	47	18.4
Medium	152	59.6
I don't know	34	13.3
Missing responses	2	0.8
Total	255	100.0
Personality Type		
Individualistic	108	42.4
Collectivistic	124	48.6
I don't know	22	8.6
Missing responses	1	0.4
Total	255	100.0
Respondent place of up-bringing		
Rural	80	31.4
Urban	164	64.3
I don't know	9	3.5
Missing response	2	0.16
Total	255	

Table 1: Demographic Features Of Respondents
(Sources: Field Survey, May, 2013)

3.2.Attitude Towards SMS

In order to examine respondent's attitude towards SMS the researchers identified respondent's ownership of mobile phone. Almost all the respondents have owned a mobile phone before 252(98.8%). Significant majority 251(98.4%) have send SMS through mobile phone. Another significant majority 251(98.4%) have received SMS through mobile phone. Significant majority 249(97.6%) have read SMS from mobile phone before. Most 106(41.6%) respondents frequently send SMS through their mobile phones. The results are shown in Table 2.

QUESTIONS/RESPONSES	Frequency	Percentage (%)
Ownership of mobile phone		
Yes	252	98.8
No	1	0.4
Missing responses	2	0.8
Total	255	100.0
Sending of SMS through mobile phone		
Yes	251	98.4
No	4	1.6
Total	255	100.0
Receiving of SMS through mobile Phone		
Yes	251	98.4
No	4	1.6
Total	255	100.0
Reading of SMS from mobile phone		
Yes	249	97.6
No	3	1.2
Missing	3	1.2
Total	255	100.0
Frequency of sending of SMS through mobile phone		
Once a while		
Frequent	75	29.4
Less frequent	106	41.6
More frequent	32	12.5
I don't know	34	13.3
Missing response	7	2.7
Total	1	0.4
	255	100.0

Table 2: Distribution Of Responses On Attitude Towards SMS
(Sources: Field Survey, May, 2013)

3.3.Features Of Respondents Hands

The characteristics of the hands of respondents were examined using subjective responses in relation to hand size, hand length, hand breath and circumference of hand. The results are shown in Table 3. On hand size, majority 193(75.7%) considered their hand size to be medium. On hand length majority 202(79.2%) have medium hand length. Significant majority 205(80.4%) consider their hand breath to be medium. Majority 187(73.3%) see their hand circumference as medium.

QUESTIONS/RESPONSES	Frequency	Percentage (%)
Hand size		
Small	49	19.2
Medium	193	75.7
Large	12	4.7
Missing response	1	0.4
Total	255	100.0
Hand length	28	11.0
Small	202	79.2
Medium	25	9.8
Large	255	100.0
Total		

Hand breath		
short	42	16.5
Medium	205	80.4
Long	8	3.1
Total	255	100.0
Circumference of hand		
Small	50	19.6
Medium	187	73.3
Long	16	6.3
Missing	2	0.8
Total	255	100.0

Table 3: Distribution Of Responses On Hand Features Of Respondents
(Sources: Field Survey, May, 2013)

3.4.Preferred Size Of Mobile Phone/Actual Size Of Keypads Of Mobile Phone/Size Of Mobile Phone/Satisfaction With Keypad
Respondents were asked of their preferred size of mobile phone. Majority 177(69.4%) prefer medium size mobile phone. On the actual size of mobile phone, majority 181(71.0%) have medium size mobile phones. The actual size of keypads of respondents according to the majority 152(59.6%) is medium followed by small size 88(34.5%).
The satisfaction level of respondents in relation to keypad size was examined. Significant majority 218(85.5%) were satisfied with the keypad of their phones. Results on preferred size of mobile phone, actual size of mobile phone, actual size of keypad and satisfaction with keypads are shown in Table 4.

QUESTIONS/RESPONSES	Frequency	Percentage (%)
Preferred size of mobile phone		
Small	58	22.7
Medium	177	69.4
large	17	6.7
Missing response	3	1.2
Total	255	100.0
Size of mobile phone		
Small	58	22.7
Medium	181	71.0
Large	13	5.1
Missing response	3	1.2
Total	255	100.0
Size of keypad		
small	88	34.5
Medium	152	59.6
Large	13	5.1
Missing response	2	0.8
Total	255	100.0
Satisfaction with keypad		
Yes	218	85.5
No	27	10.6
I don't know	7	2.7
Missing responses	3	1.2
Total	255	100.0

Table 4: Responses On Preferred Size Of Mobile Phone, Actual Size Of Phone, Actual Size Of Keypad And Satisfaction Of Keypad
(Sources: Field Survey, May, 2013)

3.5.Ranks Of Features Of Mobile Keypads To Be Changed
The ranks of the features of respondent's mobile phones they wish for change for better SMS communications are shown in Table 5. The first three features respondents wish for them to be changed is texture, simplicity of keypads and layout.

FEATURES OF MOBILE PHONE KEYPADS	PERCENTAGES
Texture	182(71.4%)
Simplicity of keypads	173(67.8%)
Layout	157(61.6%)
Shape	148(58.1%)
Space between keypads	141(55.3%)
Size of keypad	139(54.5%)

Table 5: Keypad Design Factors
(Sources: Field Survey, May, 2013)

3.6.Ranks Of Features Of Mobile Keypads Respondents Are Satisfied With
The ranks of the features of respondent's mobile phones they are satisfied with for better SMS communications are shown in Table 6. The three most satisfied features are texture, shape and simplicity of keypads. These results shows respondents are satisfied with all the features of their keypad designs.

FEATURES OF MOBILE PHONE KEYPADS	PERCENTAGES
Texture	171(67%)
Shape	160 (62.7%)
Simplicity of keypads	152(59.6)
Layout	151(59.2%)
Size of keypad	150(58.8%)
Space between keypads	139(54.5%)

Table 6: Keypad Design Factors
(Sources: Field Survey, May, 2013)

3.7.The Link Between Features Of Respondent's Hands And Prefer The Size Of Mobile Phone/Actual Mobile Phone Size/ Size Of Keypad/Satisfaction Of Size Of The Keypad
The hand features identified to influence preference for phone size, keypad size, and satisfaction of keypads in the survey are hand size, hand length, hand breath and circumference of the hand.

- **Hand size**
  Hand size significantly influences the preference for mobile phone size (chi-square=43. 421; p=0. 000); the actual size of a mobile phone (chi-square=55. 035; p=0. 000); size of the keypad (chi-square=22. 149; p=0. 001) of mobile phones.

- **Hand size and preferred mobile size**
  More respondents (54.2%) with small hand size preferred small size of a mobile phone as compare to medium size (39.6%) and large size (6.2%) of mobile phone. More respondents (79.6%) with medium hand size preferred medium size of the mobile phone as against small size (14.7%) and large size (5.8%). More respondents with larger hand size preferred medium size phone (41.7%) than small mobile phone (33.3%) and large mobile phone (25%).

- **Hand size and actual mobile size**
  More respondents with small hand size (54.2%) have small mobile phone size than medium mobile phone size (41.7%) and large phone size (4.2%). More respondents (81.2%) with medium hand size owned medium mobile phone size than small mobile phone size (15.2%) and large mobile phone size (3.7%). More respondents (41.7%) with large hand size owned a mobile phone with medium size than large mobile phone size (33.3%) and small mobile phone size (25%).

- **Hand size and actual size of keypad**
  More respondents (54.2%) with small hand size owned small sized keypads than medium sized keypads (43.8%) and large sized keypad (2.1%). More respondents (65.6%) with medium hand size owned medium sized keypads than small sized keypads (29.7%) and large sized keypads (4.7%). More respondents (41.7%) with large hand size owned small sized keypads than medium sized keypads (33.3%) and large sized keypads (25%).

- **Hand length**
  There is a statistical significant difference between hand length preference for mobile phone size (chi-square=9. 340; p=0. 053); the actual size of a mobile phone (chi-square=17. 841; p=0. 001); size of the keypad (chi-square=13. 298; p=0. 010) of mobile phones.

- **Hand length and preferred mobile size**
  More respondents (51.9%) with short hand length prefer medium size mobile phone than small sized mobile phone (44.4%) and large sized mobile phone (3.7%). More respondents (73.5%) with medium hand length prefer medium sized

mobile phones than small sized mobile phones (20.0%) and large sized mobile phones (6.5%). More respondents (64%) with longer hand length prefer medium sized mobile phone than small sized mobile phone (24%) and large sized phone (12%).

- **Hand length and actual mobile size**
  More respondents (48.1%) with short hand length owned small and medium sized mobile phones than large sized mobile phones (3.7%). More respondents (75.6%) with medium sized hand length owned medium sized phone than small sized phone (20.4%) and large sized mobile phone (4%).
  More respondents (66.7%) with long hand length owned medium sized mobile phone than small sized mobile phone (16.7%) and large mobile phone size (16.7%).

- **Hand length and actual keypad size**
  More respondents (55.6%) with short hand length owned small sized mobile phone than medium sized mobile phone (44.4%) and large sized mobile phone (0.0%). More respondents (63.7%) with medium hand length owned medium sized mobile phone than small sized mobile phone (31.8%) and large sized mobile phone (4.5%). More respondents (48%) with long hand length owned medium sized mobile phone than small sized mobile phone (36%) and large sized mobile phone (16%).

- **Hand breath**
  There is a statistical significant difference between hand breath and preference for mobile phone size (chi-square=43. 430; p=0. 000) and size of the keypad (chi-square=21. 866; p=0. 000) of mobile phones.

- **Hand breath and preferred mobile phone size**
  More respondents (56.1%) with short hand breath prefer small sized mobile phone than medium sized mobile phone (41.5%) and large sized mobile phone (2.4%). More respondents (77.3%) with medium hand breath prefer medium sized mobile phone than small sized mobile phone (16.3%) and large sized mobile phone (6.4%). More respondents (37. 5%) with long hand breath prefer medium sized mobile phone and large sized mobile phone than small sized mobile phone (25%).

- **Hand length and actual keypad size**
  More respondents (61%) with short hand breath owned small sized keypad than medium sized keypad (39%) and large sized keypad (0%). More respondents (64.7%) with medium hand breath owned medium sized keypads than small sized keypads (29.9%) and large sized keypads (5.4%). More respondents (50%) with long hand breath owned medium sized keypads than small sized keypads and large sized keypads (25%).

- **Circumference of hand**
  There is statistical significant difference between circumference of hand and preference for mobile phone size (chi-square=18.737; p=0.001); size of keypad (chi-square=13.311; p=0.010) of mobile phones and actual mobile phone size (chi-square=20.231; p=0.000).

- **Circumference of hand and preferred mobile phone size**
  More respondents (49%) with a small hand circumference prefer medium sized mobile phone than small sized mobile phone (40.8%) and large sized mobile phone (10.2%). More respondents (77.5%) with a medium hand circumference prefer medium sized mobile phone than small sized mobile phone (17.1%) and large sized mobile phone (5.3%). More respondents (50%) with a long hand circumference prefer medium sized mobile phone than large sized mobile phone (12.5%) than small sized mobile phone (37.5%).

- **Circumference of hand and actual mobile phone size of respondents**
  More respondents (50%) with a small hand circumference owned medium sized mobile phone than small sized mobile phones (42%) and large sized mobile phone (8%). More respondents (79.1%) with a medium hand circumference owned medium sized mobile phone than small sized mobile phone (17.1%) and large sized mobile phone (3.7%). More respondents (53%) with a long hand circumference owned medium sized mobile phones than small sized mobile phones (33.3%) and large sized mobile phones (13.3%).

- **Circumference of hand and actual keypad of mobile phones of respondents**
  More respondents (56%) with a small hand circumference owned small sized keypad mobile phone than medium sized keypad mobile phones (38%) and large sized keypad mobile phones (6%). More respondents (65.8%) with a medium hand circumference owned medium sized keypads of a mobile phone than small sized keypad of a mobile phone (29.4%) and large sized keypad of a mobile phone (4.8%). More respondents (62.5%) with a long hand circumference owned medium sized keypad of mobile phones than small sized keypad of mobile phones (31.2%) and large sized keypad of mobile phones (6.2%).

3.8.The Link Between Features Of Respondent's Hands And Satisfaction Of Mobile Phone Keypads Design Factors
The relationship between features of the hand and the satisfaction of keypad design factors was examined. The hand features are hand size; hand length; hand breath and circumference of the hand.

- **Hand size**
  Hand size significantly influence the satisfaction of simplicity of keypad design with respect to messaging/ease of use (chi-square=21.975; p=0.038). More respondents (61.8%) with medium hand size are satisfied with the simplicity of keypad use in massaging than those with large hand size (58.3%) and small hand size (55.1%).

- **Hand breath**
  Hand breath significantly influence the satisfaction of simplicity of keypad design with respect to messaging/ease of use (chi-square=15.940; p=0.043) and texture of keypad (chi-square=15.335= p=0.053). More respondents (62.7%) with medium hand breath are satisfied with simplicity of keypad use in massaging than those with large hand breath (54.1%) and short hand breath (46.4%). More respondents (75%) with long hand breath are satisfied with texture of keypad than those with short hand breath (69.1%) and medium hand breath (66.4%).
- **Hand circumference**
  Hand circumference significantly influence the satisfaction of the shape of keypad design (chi-square=16.288; p=0.038). More respondents (75%) with long hand circumference are satisfied with the shape of keypad than those with medium hand circumference (61.5%) and short hand circumference (62%).

3.9.Discussion

The findings on the relationship between hand size and hand breath and simplicity and texture of keypad is not consistent with that of Balakrishnan and Yeow (2007) who reported of no significant effect between hand size and hand breath and simplicity and texture of keypad design.

The findings on the effect of hand circumference and shape of keypad design is not consistent with the findings of Balakrishnan and Yeow (2007) who established no significant relationship between hand features and the shape of keypad of mobile phone.

The findings on key layout and space between keypads are not in support of the findings of previous studies such as Balakrishnan and Yeow (2007), Ornella and Stephanie (2006)**,** Axup et al. (2005), Balakrishnan et al. (2005), Soriano et al. (2005) and Han et al. (2004) who reported of significant difference between hand features and key layout and space between keypads.

Respondents with larger hands size, longer hand breath and longer hand circumference will normally have larger hand thumbs and will tend to be more careful when making key presses to avoid making or reduce errors. This increases the time spent on composing a message when using SMS. These force users to make more calls than sending text messages.

The findings on hand features and keypad design factors was not in support of the findings of previous researchers such as Balakrishnan and Yeow (2007) who reported of statistical significant differences between hand-sizes and overall keypad design satisfaction.

4.Conclusion

The objective of the paper has been achieved. Hand features (hand size, hand breath and hand circumference) have been found to influence the preference of keypad design factors. There should be improvement on simplicity, texture of keypad and shape of keypad design. Mobile phone designers and marketers should incorporate these findings into their production and marketing strategies. These findings should be used in segmentation strategies. Customized mobile phones must be produced to satisfy customers.

The study should be replicated in other departments of the school and other communities of the country to examine if the findings will be replicated. Causal studies should be issued for future studies. The role of demographic variables in the satisfaction of keypad design factors should be examined.

5.References

1) Axup, J., Viller S., & Bidwell, N.s Usability of a Mobile, Group Communication Prototype While Rendezvousing. In CTS'05 International Symposium on Collaborative Technologies and Systems-Special Session on Mobile Collaborative Work.
2) Balakrishnan, V., & Yeow, P. H. P. (2007). SMS usage satisfaction: Influences of hand anthropometry and gender. Hum. IT, 9, 52-75.
3) Balakrishnan, V., Yeow, P., H., P., & Ngo, D., C., L. (2005). An investigation on the ergonomic problems of using mobile phones to send SMS. In: P.D., & P.T., McCabe (Eds.) Contemporary Ergonomics 2005 (195-199). United Kingdom: Taylor & Francis.
4) Barkhuus, L. (2005). Why Everyone Loves to Text Message: Social Management with SMS Proceedings from ACM GROUP '05. International ACM SIGGROUP conference on supporting group work, New York, ACM
5) Cockburn, A., & Siresena, A. (2003). "Evaluating Mobile Text Entry with the Fastap Keypad." People and Computers XVII, British Computer Society Conference on Human Computer Interaction, Bath: University of Canterbury. 77–80.
6) Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well being: Three decades of progress. Psychology Bulletin, 276-302.
7) Faulkner, X., & Culwin, F. (2005). When fingers do the talking: a study of text messaging. Interacting with Computers 17, 167-185.
8) Grinter, R.E. and Eldridge, M. (2001). Y do tngrs luv 2 txt msg? In Prinz, M., Jarke, Y., Schmidt, K. and Wilf, V. (eds.). Proceedings of the Seventh European Conference on Computer-Supported Cooperative Work ECSCW'01, pp. 219-238. Kluwer Academic Publishers, Dordrecht.
9) Han, S.H., Kim, K. J., Yun, M. H., Hongand, S. W., & Kim, J. (2004). Identifying mobile phone design features critical to user satisfaction. Hum. Factors Ergono. Manufact., 14,15-29.
10) Kurniawan, S., Mahmud, M. & Nugroho. Y. (2006). A Study of the Use of Mobile Phones by Older Persons. Computer Human Interaction 2006, Canada.

11) Kwon, H. S., & Chidambaram. L. (2000). "A Test of the Technology Acceptance Model-The Case of Cellular Telephone Adoption" in the Proceedings of the 33rd Hawaii International Conference on System Sciences, 2000.

12) Levy-Garboua, L., Montmarquette, C., & Simonnet, V. (2005). Job Satisfaction and quits. Labour Economics, 14, 251-260.

13) Ling, R. (2005). The sociolinguistics of SMS: An Analysis of SMS use by a Random Sample of Norwegians. Mobile Communi., 31, 335-349.

14) Mackenzie, S. I. (2002). Mobile text entry using three keys. Proceedings of the 2nd Nordic Conference on Human-Computer Interaction, (NCHCI'02), 27-34. ACM New York, NY, USA.

15) Maragoudakis, M., Tselios, N. K., Fakotakis, N., & Avouris, N. M. (2002). Improving SMS Usability Using Bayesian Networks. In Methods and Applications of Artificial Intelligence, Vlahavas, I. P. and Spyropoulos, C.D. (Eds), 179–190, Berlin: Springer-Verlag.

16) Ng, P. Y., Voges, K., & Goi, C. L. (2010). The Importance of Mobile Phone Applications to Young Consumers: An exploratory study in Malaysia, Australian & New Zealand Marketing Academy (ANZMAC) 2010, Christchurch, New Zealand, 29 November – 1December.

17) Nysveen, H., Pedersen, P. E., & Thorbjørnsen, H. (2005). Intentions to use mobile services: Antecedents and cross-service comparisons. Journal of the Academy of Marketing Science, 33(3), 330-346.

18) Oksman, V.& Raitiainen, P. (2001). "Perhaps it is a body part". How the mobile phone became an organic part of the everyday lifes of children and teenagers. Presented at the 15. Nordiska konferensen för medie- ock kommunikationsforskning, Reykjavik, Island, August, 11-13.

19) Ornella, P., & Stephanie, B. (2006). Universal Designs for Mobile Phones: A Case Study. Computer Human Interaction 2006 (Work in Progress). Quebec, Canada.

20) Reid, F. J. M., & Reid, D. J. (2004). Text Appeal: The Psychology of SMS texting and its implications for the design of mobile phone interfaces. Campus-Wide Information Systems, 21 (5), 196-200.

21) Silfverberg, M., Mackenzie, I. S., & Korhonen, P. (2000). Predicting Text Entry Speed on Mobile Phones. Computer Human Interaction 2000, 2 (1), 9-16.

22) Soriano, C., Raikundalia, G. K., & Szajman, J. (2005). A Usability Study of Short Message Service on Middle-Aged Users. In Proceedings of OZCHI 2005, Canberra, Australia (2005)

23) Ward, D., A. F. Blackwell, A. F., & MacKay, D. J. C. (2000). Dashera data entry interface using continuous gestures and language models. In the ACM Symposium on User Inter ace Software and Technology page, 129-37.

24) Wigdor, D., & Balakrishnan, R. (2003). TiltText: Using Tilt for Text Input to Mobile Phones. CHI Letters, 5, 81–89.

25) Yun, M. H., Han, S., Hong, S. & Kim, J. (2003). Incorporating user satilpsfaction into the look-and feel of mobile phone design. Ergonomics, 46, 1423-1434.