

## Enhancing Multimedia Communication Components in Instructional Consulting Service Online: Students' Perspective and Perception

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### Abstract

Online consultation - one of the advancement of communication technology in consulting service is conducted electronically in various contexts such as online medical consultation, IT consulting and online financial service consultation. It enables participants communicate in synchronous and asynchronous way [1]. However, implementation of this technology in instructional consultation in higher education is not fully integrated. This may due to lack of investigation, analyzing and proper strategy planning on problem encountered by students and lecturer. This paper discuss about the limitations of typical instructional consultation and students' perspective and perception on conducting consulting service online. The potential benefits of communication components for students in higher education are determined by investigate their perceptions and perspectives on implementation of communication technology for online instructional consultation. The limitations of typical instructional consultation that elicited from literature review are included in this quantitative research study in order to investigate precisely students' response pertaining to instructional consulting service in higher education. Data was solicited from a sample of 130 students in College of Arts and Science (CAS), College of Business (COB) and College of Law, Government and International Studies (COLGIS) in Universiti Utara Malaysia (UUM) via simple random sampling method. Student's response to five point Likert-type scale anchored by the terms Strongly Disagree (1) to Strongly Agree (5), Not Important (1) to Extremely Important (5) and Never (1) to Very Often (5). The finding of the research revealed that students were generally positive about potential of multimedia communication tools for traditional consultation system in higher education organization.

**Keywords:** Instructional Consultation, Real time communication technology, face to face consultation, online instructional consultation, Yamane's (1967) formula.

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## 1. INTRODUCTION

Instructional consultation is commonly recognized as a problem-solving model systematically designed around school IC [2] with the purpose in solving academic and behavioural problem encountered by students. Accompanying with the rapid growth of technology advance, the need of providing consulting and information delivery service online are increasingly concerned, not only in financial service [3] or

business context [4] but also telemedicine consultation that are widely studied by many researchers [5]. According to [4], conducting of consultation service online help to keep the cost to a minimum while offering competitive service on client's demand as well as enable the staff work from client location regardless the working place. At the early phase of conducting consulting service online, asynchronous technology such as email and forum discussion are more commonly employed as collaboration tools among these virtual team staff compared with synchronous technology that enhance the collaboration on real time [23].

At present, as the advantages of synchronous communication technology had been acknowledged, many organizations started to blend this technology advance as part of e-consultation, enable the participants to communicate in synchronous and asynchronous way [1]. As a result, web conferencing platform that mushroomed developed and adopted to fulfill demand of organization, to provide support and enhance collaborative on real time and delayed time, to overcome the time and space constraints that burden face to face consultation. More specifically, video conference component engender high social presence that absence in text-based mediated communication, enable conveying of information through non-verbal cues such as facial expression, gesture and body language. This directly will reduce a sense of isolated feeling as inhibited from virtual environment.

However, in education context, even though there are many suggestion regarding with provide consulting service online [24] & [25], but yet the used of communication technology is not fully implemented as an essential support for instructional consultation in higher education. Shifting of typical instructional consultation towards virtual consultation is not simple. Since there is lack of investigation, analyzing and proper strategy planning on issues encountered by students and lecturer for instructional consultation in higher education. There is lack of quantitative research for study mentor-mentee system in education context [6]. Furthermore, there is no standard and common consultation process as a guideline in designation of consultation process. Many researchers have their different perspectives on the typical consultation processes. For example, consultation processes may different related to consultation purpose, and the tasks and actors involved [2]. While some researchers present that designation of e-consultation platform should support consulting processes as in face to face consultation [7] & [8] and more specifically the task involved [9], [10] & [11]. Thus, It can be seen that designation of online instructional consultation model should be look as academic problem-solving consultation based on overall aspects: the consultation process, the tasks perform on each phase and actors involved. Before making decision on whether which communication tools are appropriate to be implemented, a preliminary study on students' perspective and perception towards conducting consultation service online are conducted.

## **2. BACKGROUNDS**

From literature review, there are 3 majors problems on typical consultation in higher education identified which regarding with the difficulties faced when participants are at a distance, ineffective time management [12] & [13] and last, but not least, the problem on recording consultation session and management of recorded document in systematic and effective way for later references and review.

Mentor-mentee system in higher education in Malaysia is to provide advisement and guidance regarding students' academic matters and personal problem. A lecturer can schedule a consultation time to meet with their students. However, it does not guarantee that students can meet their mentor being on time. They may face the situation in which one or more members are at physically separated environment. Research on the higher education in Malaysia conducted by had found that majority of students show their unsatisfactory on the mentor-mentee system on difficulties to meet with their supervisor for consultation [14]. This may due to sometimes, lecturer may have conduct emergency meeting, attend to the outstation seminar and may not meet their students for a period of time. This indirectly leads to student frustration when the people they rely on solving urgent problem are probably at a distance. The other reason related, travelling and recovering from a remote location are time-consuming and costly endeavour [15]. It is not always promptness for working adults that take part-time course especially postgraduate student, have family commitment or job commitment to travel to a remote location just to meet their lecturer. Loss of human contact indirectly cause decrement in interactivity among participants when they are at a distance. These difficulties with long distance travel, time as well as cost spending on travel may reduce with accessible and usable of ICT in field. Nonetheless, time management as the key ingredient to determine the successful of consultation process or may lead to consultation frustration

especially when in synchronous discussion [16]. Communities do exist successfully without effective time schedule management but those communities that are designed around time management are provided with much greater flexibility. Observation on the mentor-mentee system in higher education in Malaysia shows that insufficient time and inconsistent consultation time schedule by lecturer or staff of the faculty cause student lack of enthusiasm to meet with their mentor [12] & [13].

The third problem related to second problem in which recorded documents are needed for future review or references. Effective and systematic way in recording meeting and organization of recorded document is essential in community and work organization. Usually, meticulous students may take note during consultation session. However, it is not always promptness for them to do so as hand writing take longer to be produced rather than read or speech. If they attend to take note, but on the same time, they may not focus on discussion and information delivered. This circumstance may due to human limitation in performing multi-task simultaneously [17]. Lack of focalization in content delivered during consultation may cause difficulties especially in making decision.

Hence, regarding with the problem addressed, building consensus on instructional consultation processes in higher education and define the communication technology that best suit the participants' requirement is important. Human are not all alike. Thus, this research emphasizes more on human factors. In order to explore more deeply on students' behaviour, attitudes and goals on typical consultation, their perspective and perception towards implementation of multimedia components is investigated.

### 3. OBJECTIVES

The specific aims of the study are threefold as below:

- a) To analyze students' problem on face to face instructional consultation in higher education
- b) To analyze students' attitudes and behaviour towards face-to-face consultation in higher education.
- c) To analyze on students' perceptions on online communication tools.

### 4. METHODOLOGY

This study attempts to focus on several aspects of instructional consultation service that can be measured:

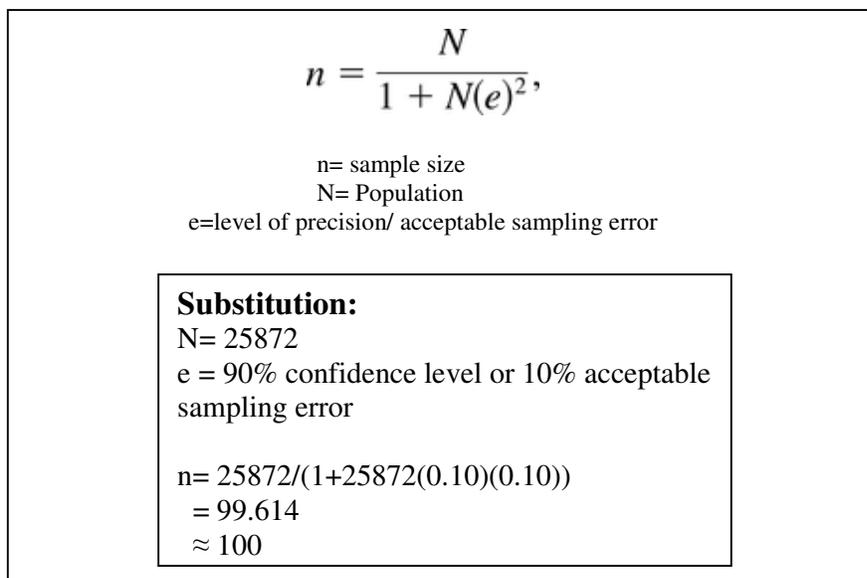
#### Sample Characteristics

Respondents (Students)	College of Arts and Science (CAS)	College of Business (COB)	College of Law, Government and International Studies (COLGIS)	Total
Diploma Lepas an Ijazah	841	-	-	841
Diploma	67	-	-	67
Bachelor Degree	5977	10556	2578	19111
Master	2229	2144	248	4621
PHD	373	690	169	1232
Total	9487	13390	2995	25872

**TABLE 1:** The Approximate Total Population of Students in UUM for 2009/2010 Sessions

Table 1 shows the total population in Universiti Utara Malaysia (UUM) was estimated at 25872 students for 2009/2010 sessions. Obviously, it is impossible to collect all the data from wide and diverse range of

population in UUM. According to [18], it's necessary to determine the accurate sample size in order to obtain the meaningful result. Thus, Yamane's formula was applied by draw the identical sample from the large population in Universiti Utara Malaysia (UUM). Figure 1 shows the Yamane's formula for determining the sample size of student's population (n=25872) with 90% confidence level and error limit of 10%.



**FIGURE 1:** Yamane's Formula (1967)

Based on table of determining the sample size and margin of error developed by Yamane [22], 100 obtained responses are needed for population of 25872 students in UUM. Thus, in order to compensate for non-response or non-returned questionnaires [22], the sample size is increase to 30% in which 130 students was chosen from College of Arts and Science (CAS), College of Law, Government and International Studies (COLGIS) and College of Business (COB) in Universiti Utara Malaysia (UUM). Of all 130 questionnaires distributed randomly, only 108 questionnaires were returned and 6 were missing values, results a response rate of 78%. A reliability analysis (Cronbach's Alpha) was employed for each dimension. The results show satisfied results (higher than 0.60) ranging from the lowest 0.678 to highest 0.878 for dimensions as stated in table 2.

Dimension	Cronbach's Alpha
Students' Problem on Consultation	0.678
Importance of Features for Online Communication Tools	0.852
Students' Behaviours Towards Face to face Consultation	0.878

**TABLE 2:** Cronbach's Alpha for All Dimensions

The first part of questionnaire showed that respondents consisted of 37% students from College of Arts and Science (CAS), 38% students from College of Business (COB) and 25% students from College of Law, Government and International Studies (COLGIS). The population mainly consisted of undergraduate students (74%) while 26 % are postgraduate students.

## 5. ANALYSIS AND FINDINGS

### 5.1 Problem Faced During Face-to-Face Consultation

Figure 2 shows that out of 108 respondents in Universiti Utara Malaysia (UUM), 54.7% of them encountered with problem in consultation with their lecturers. Out of 58 students that encountered with difficulties, majority of them (43.1%) meet their lecturer for sometimes while only 1.7% of them never meet their lecturer for consultation.

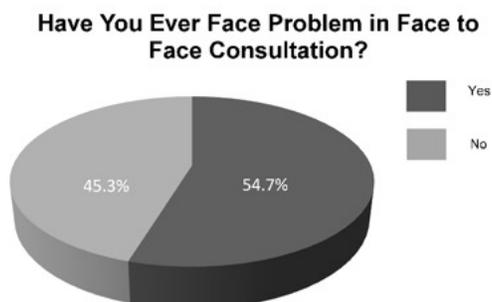


FIGURE 2: Respondents by Problem in Face-to-Face Consultation

Table 3 shows five dimensions of frequency for students perceived problems on face-to-face consultation in higher education environment. From the mean analysis, it is clear that the score are between 2.60 and 3.31. This means that students give the score above the middle point of 2.50 where a Likert-scale between 1 and 5. The median score also indicate that the score are distributed closer to normal distribution.

Scale							
Problems	NA 0	NI 1	2	3	4	5	N= 58
Frequency (%)	5.2	12.1	20.7	43.1	17.2	1.7	Mean = 2.60
Ineffective Time Management (%)	1.7	19.0	10.3	41.4	22.4	5.2	Mean = 2.79
Constraint by Distance (%)	1.7	10.3	13.8	56.9	15.5	1.7	Mean =2.79
Record Consultation Session (%)	1.7	12.1	19.0	39.7	10.7	6.9	Mean =2.86
Emergency Consultation (%)	1.7	22.4	8.6	41.4	17.2	8.6	Mean =3.31

Note: 0-Not Applicable; 1-Often; 5-Never

TABLE 3: Students' Behaviours and Attitudes towards Face to face Consultation in Higher Education

Of these five dimensions of perceived problems, most of the students (56.9%) encountered with problem in meet their lecturer when both of them are at a distance sometimes. Only 1.7 % of them are not

constraint by distance. 94.8 % of students having timing problem in which majority of them (41.4%) having insufficient time or ineffective time management. Observation on the mentor-mentee system in higher education in Malaysia show those students' insufficient time and inconsistent consultation time schedule by lecturer or staff of the faculty cause student lack of enthusiasm to meet with their mentor [6] & [13]. Whereas 48 students (82.8%) having the problem in record consultation session or take note during consultation session. It is significant to note that students concede that they always conduct emergency consultation with lecturers (mean – 3.31). There are relatively high-level percentages (22.4%) of students (with the scale “very often”) to meet their lecturers for emergency consultation as compare to other 4 dimensions with the same scale.

### 5.2 Importance Features of Online Instructional Consultation

Figure 3 and table 4 present students' perceived importance of features of multimedia communication components to be included in online instructional consultation model. The criteria are measured in term of means and standard deviation by using scale of 1 (Not Important) to 5 (Extremely Important).

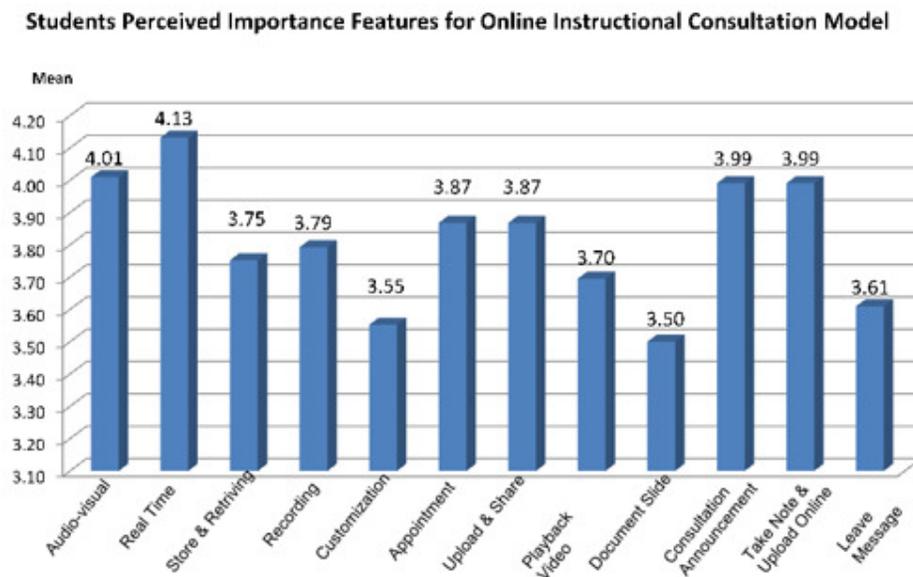


FIGURE 3: Students Perceived Importance Features for Online Instructional Consultation Model

No	Variables	Number of Respondents				
		Valid	Missing	Mean	Median	Std. Deviation
Q1	Ability to deliver information clearly in audio-visual form.	106	2	4.01	4.00	0.910
Q2	Ability to deliver information in real-time	106	2	4.13	4.00	1.052
Q3	Ability to store and retrieve consultation document and agenda record	105	3	3.75	4.00	1.133
Q4	Ability to record consultation session	106	2	3.79	4.00	0.933
Q5	Ability to customize profile online	105	3	3.55	4.00	0.940
Q6	Ability to make appointment online	106	2	3.87	4.00	0.947
Q7	Ability to upload and share document online.	106	2	3.87	4.00	1.005
Q8	Ability to playback video online in video player	105	3	3.70	4.00	1.136
Q9	Ability to view document online in slideshow	106	2	1.75	4.00	1.272
Q10	Ability to get consultation announcement online.	106	2	3.99	4.00	0.889
Q11	Ability to take note online and upload note for sharing.	106	2	3.99	4.00	0.856
Q12	Ability to leave message online	105	3	3.61	4.00	1.122

**TABLE 4:** Students' Perceived Importance Features of Multimedia Communication Components

From table 4, mean analysis is to determine the average score of the 12 variables which rating the level of importance of different function and features to be included in multimedia consultation components. It can be seen that students provide the score between 3.50 and 4.13. Students provide the score above 2.50 indicates that they are strongly feels that all the proposed function and features are important and may take into consideration when design the multimedia communication components. The high score mean (4.13) for variable "ability to deliver information in real-time" and variable "ability to deliver information clearly in audio-visual form" with score mean (4.01) indicates that students concede dynamic two way communication with immediate feedback, as well as deliver information in visual and verbal cues.

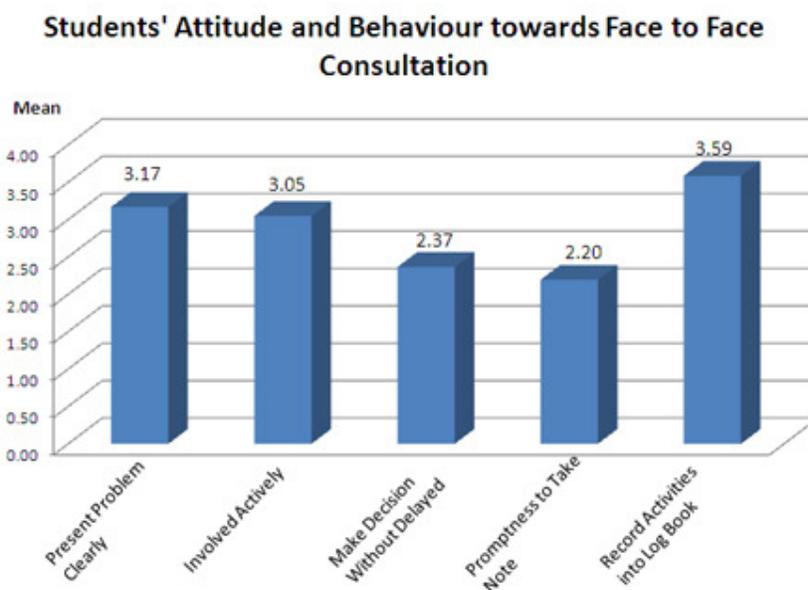
The lowest mean score (mean-3.5) for variable "ability to view document online in slideshow" resulted. It is significant to note that students concede that it's not as important as other features as denotes by students to be included in online consultation model. This may due to they probably need document downloaded, store in hard disk and view them when they are offline instead of playback the consultation document online.

### 5.3 Students' Attitudes and Behaviour toward Face-to-Face Consultation in Higher Education

Respondents were asked to indicate their level of agreement and disagreement with the statements regarding with consultation in higher education. Their responses are present in table 5 and figure 4.

No	Variables	Number of Respondents		Mean	Median	Std. Deviation
		Valid	Missing			
Q1	I know my problem very well and can present my problem clearly to lecturer face to face.	101	7	3.17	3.00	1.025
Q2	I involve actively by give many opinions during consultation session.	105	3	3.05	3.00	0.942
Q3	The consultation decision can be made without delayed to later consultation	106	2	2.37	3.00	0.764
Q4	It is always promptness for me to take note while lecturers deliver the information.	106	2	2.20	3.00	1.129
Q5	I always record my consultation activities into logbook.	106	2	3.59	4.00	1.226

**TABLE 5:** Students' Behaviours and Attitudes towards Face to face Consultation in Higher Education



**FIGURE 4:** Students' Behaviours and Attitudes towards Face to face Consultation in Higher Education

Based on in-depth analysis of students' behaviour on face-to-face consultation, 5 questions were constructed. Table 5 shows the relative students agreement and disagreement on the statements. Strong evidence with the high mean score (mean-3.59) shows that most of the students agree that they always record their consultation activities into logbook. However, when asked about whether involve actively in face-to-face consultation, they neither agreeing nor disagreeing (mean-3.05).

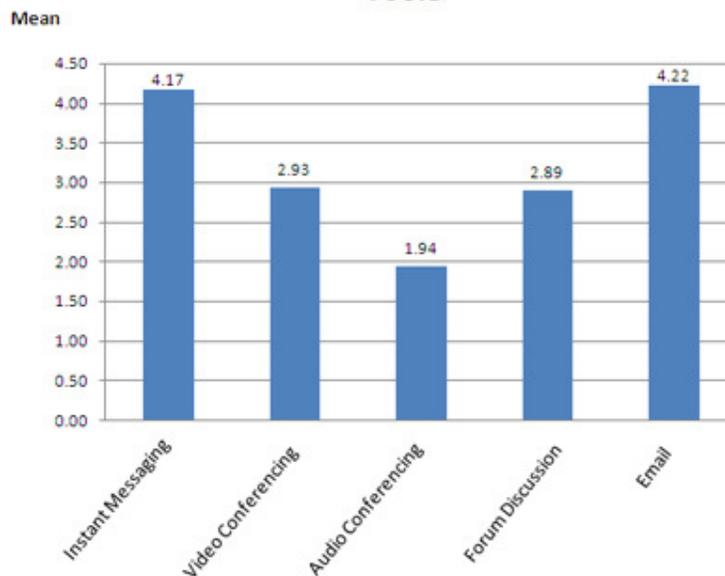
On the other side, most of the students claim that they are not always promptness to take note while lecturer delivers the information during consultation session (mean-2.20). This circumstance may due to human limitation in performing multi-task simultaneously [17]. A lower mean value (2.37) denotes that most of the consultation session may sometimes terminate before decision being made and perhaps delayed for later consultation.

#### 5.4 Students' Perception on the Frequency used of Online Communication Tools

No	Variables	Number of Respondents			Mean	Median	Std. Deviation
		Valid	Missing				
Q1	Instant Messaging	108	0	4.17	4.00	1.032	
Q2	Video Conferencing	108	0	2.93	3.00	1.257	
Q3	Audio Conferencing	108	0	1.94	2.00	1.036	
Q4	Forum Discussion	108	0	2.89	3.00	1.231	
Q5	Email	108	0	4.22	5.00	1.097	

**TABLE 6:** Students' Perceived on the Frequently Used of Online Communication Tools

#### Students' Perceived on Frequently Used Online Communication Tools



**FIGURE 5:** Students' Perceived on Frequently Used Communication Tools

Table 6 and figure 5 shows frequency use of online communication tools among students in Universiti Utara Malaysia (UUM). The criteria are measured in term of means and standard deviation by using scale of 1 (Never) to 5 (Very Often). In general, students are often using all the proposed online communication tools unless the audio conferencing with the low mean score (mean-1.94). A high mean value for students' response indicates that respondents were very often use email for online communication tools as compare to the other online communication tools. This followed by synchronous communication tools which is videoconference that provide the mean score 2.93. Even though synchronous online communication were found to offer a number of advantages over asynchronous online communication, however, email indicates the most frequently used by intended participants that do not expect immediate response to the proffered comment, for documents retrieval and submission as well as place comments for later viewing.

## 6. SUMMARY OF RESULTS

The finding of this research revealed that students were generally positive about potential usefulness of multimedia communication tools for traditional consultation system in higher education organization. 54.7% students report their consensus on the consultation problem as derived from literature review.

Almost 93% of them denote that they are willing to learn new technology that can assist them in consulting purpose even though some of them are not encountered with problem in traditional consultation.

Among the 12 specified important features of multimedia components, obviously it cannot be denied that students' highly perceptions towards real time audio-visual communication tools with the high mean score value 4.13 for "ability to deliver information at real time" and mean score value 4.01 for "ability to deliver information clearly in visual and audio form" denotes that video conference are necessary to be included in online consultation model. This rich media (synchronous) convey information at high rate to resolve the ambiguity. These synchronous communication components would be the useful medium for conducting the emergency consultation but in situation in which both the students and instructor are available on the specific time. The media richness and social presence level of video conference component would provide high intimacy and immediacy feedback [19] & [20]. The facial expression and gesture movement allow the participants to access participants understanding. Even though the degree of intimacy and immediacy of video conferencing is not as high as face to face communication, however, it is the most suitable multimedia component that can represent more warmth and a sense of sociability when communicate online.

The high mean value for online communication tools that frequently used by students are instant messaging and email denotes that real time synchronous communication tools are not the only one that dominate the way we communicate online but combination used of these communication tools may facilitate the online consultation effectively. Students perceived instant messaging and email more satisfying and easy to use as they had experience about it and may included in online instructional consultation application. Besides that, email is predicted to better process uncertainty information. Students may sometimes communicate through video conference even though it is a new matter in real time communication context and its advantages are yet to be discovered. Similarly, a high mean value for the usage of online communication tools (mean-2.93) denotes a favourable response towards the use of synchronous videoconference. In contrast, the lowest mean score are audio conference (mean-1.93). Both of these online communication tools are synchronous when the participants aware of the dynamic two ways communication more or less in real time, differing only as video conference are in visual and verbal cues, provide look as the "look and feel" that does not exist for audio conference. Audio conferencing participants may feel inhibited when cannot "see" each other at remote sites. Besides that, students denoted that get the updated consultation announcement online is important as well as the ability to make appointment online.

Dealing effectively with online communication technology not only the potential usefulness of this ICT tools but also related with students' attitudes and behaviours towards the instructional consultation in institution of higher education. Their interactivity indirectly affects the successfulness of online learning [21]. For these reasons, students' attitudes and behaviours were examined. The results (as in figure 4) show that means score value for all the four variables did not achieve at least 4.00 which denote the degree of agreement. Low mean value (2.20) of variable "I involve actively by give many opinions during consultation session" indicates that students mostly disagree that they contribute actively towards the consultation session. Presumable over talkative or passive participants may cause lack of interactivity and poor communication among participants that lead to consultation frustration. Instead of play the role as consultant that initiate the consultation session and terminate the session, lecturer should be given the authority to control students' speaking order during online collaboration. Overall, there is necessary to add in synchronous verbal and visual communication cues as provided in video conference to lead to the overall better online communication processes. Presumably, combination used of those synchronous and asynchronous tools may facilitate consulting service effectively.

## 7. CONCLUSION

Increasing concerned on the conducted instructional consultation online would help to generate motivation for researchers to study on the user requirements as well as bring a fresh perspective to existing issues. For the future research that regarding with online instructional consultation in higher education need to include analyzing on problem encountered by lecturer as well as their perceptions' on usage of communication tools for assisting consulting in higher education. Lecturers play an important role in control the way the student's reaction and communicate during online consultation session. Thus, their perspectives on the use of multimedia communication applications will be needed to be

emphasizing precisely for designation of online consultation system. As a conclusion, research in this context is essential if we are to understand the communication and collaboration environment more efficiently and thus learn how to improve the participant's quality of online consultation.

## 8. REFERENCES

1. Caulat., G., E. D. Haan. "Virtual Peer Consultation: How Virtual Leaders Learn" *Organization & People*. 13(8): 24-32, 2006
2. Rosenfield. S. A. and T. A. Gravois. "Instructional consultation teams, Lawrence Erlbaum". 1987
3. Tanaka. T., A. Koga., H. Mizuno and H. Yajima. "Design of User Interface for Tele-consultation system over the Web". In Proceedings of SMC '99 IEEE International Conference on Systems Man and Cybernetics, 1999
4. Newman. P. "Consultation". Available at: <http://www.rppc.net/>, 2005, [Accessed 2009]
5. Liakhouski., V., S. Rylkov., et al. "Teleconsultation and image analysis system in radiation induced thyroid cancer". In Proceedings of AMIA Annual Symposium. Minsk, Belarus, American Medical Informatics Association, 2005
6. Omar. H. B. D. "Persepsi Pelajar-pelajar terhadap Sistem Mentor-mentee di Universiti Utara Malaysia, Sintok: Universiti Utara Malaysia". 2004
7. Vassilakis., C., D. Gouscos., et al. "A Semantic-based Consultation Workbench". In Proceedings of ITI 3rd International Conference on Information and Communication Technology (IEEE), 2005
8. Carlson., P. J., G. B. Davis. "An investigation of media selection among directors and managers: from "self" to "other" orientation". *Business Administration* 22(3):335-362, 1998
9. Morison., Newman. "Psychoeducational Consultation. 2009". (2009) Available at: [http://www.indiana.edu/~deanfac/blfal01/educ/educ\\_g645\\_5807.html](http://www.indiana.edu/~deanfac/blfal01/educ/educ_g645_5807.html), 2001
10. Fulk., J., J. Schmitz., et al. "A social influence model of technology use". *Organizations and communication technology*, Newbury Park, CA: Sage, 1990
11. Fagan. G. H., D. R. Newman., et al. "E-consultation: evaluating appropriate technologies and processes for citizens' participation in public policy".(2006) Available at: [http://eprints.nuim.ie/468/1/ecrp\\_report.pdf](http://eprints.nuim.ie/468/1/ecrp_report.pdf) [Accesed 12 August, 2009]
12. Omar., H. B. D. "Persepsi Pelajar-pelajar terhadap Sistem Mentor-mentee di Universiti Utara Malaysia, Sintok: Universiti Utara Malaysia". 2004
13. Karim., O. A., K. A. Taib., et al. "Pembudayaan Ilmu dan Pelaksanaan Sistem Mentor-mentee di Jabatan Kejuruteraan Awam dan Struktur- Suatu Analisis.". 2005
14. Siti Haslina Hussin and Khadijah Mohd Tuah. "Towards a Quality Support Service: The Academic Advising System: A Lesson from the FSS Mentor-Mentee System". (2007) Available at: [http://www.calm.unimas.my/calm\\_arc/insite\\_v10/article2.html](http://www.calm.unimas.my/calm_arc/insite_v10/article2.html) [23 September 2010]
15. Stephens, S et al "On the Road from Consultation Cynicism to Energising e-Consultation." *The Electronic Journal of e-Government*, 4(2):87 – 94, 2006
16. Lewis., D., B. Allan. "Virtual learning communities as a vehicle for workforce development: a

- case study.*" Journal of Workplace learning 18(6): 367-383, 2005
17. Heuer., H. "*Motor Constraints in Dual Task Performance. 2009.*" (2009) Available at: [http://books.google.com.my/books?id=e38SN9vhSIC&dq=herbert+heuer&printsec=frontcover&source=bl&ots=k0\\_nMWRVAj&sig=yfT8nn\\_aydNWQDHS0L83fOoZBm8&hl=en&ei=QiFxSoGvE5KsswP4tbTICA&sa=X&oi=book\\_result&ct=result&resnum=1](http://books.google.com.my/books?id=e38SN9vhSIC&dq=herbert+heuer&printsec=frontcover&source=bl&ots=k0_nMWRVAj&sig=yfT8nn_aydNWQDHS0L83fOoZBm8&hl=en&ei=QiFxSoGvE5KsswP4tbTICA&sa=X&oi=book_result&ct=result&resnum=1) , 1991.
  18. High, R. "*Important factors in designing statistical power analysis studies.*" Computing News, Summer, (14-15): 2000
  19. Short, J., Williams, E. & Christie, B. "*The social psychology of telecommunications.*" London: John Willey & Sons, Ltd, 1976
  20. Trevino, L. K., Webster, J., Stein, E. W. "*Making connections: Complementary influences on communication media choices, attitudes, and use.*" Organization Science, 11(2):163-182, 2000
  21. Bude Su, Curtis J. Bonk, Richard J. Magjuka, Xiaojing Liu, Seung-hee Lee. "*The Importance of Interaction in Web-Based Education: A Program-level Case Study of Online MBA Courses.*" Available at: <http://www.ncolr.org/jiol/issues/PDF/4.1.1.pdf>, 2005 [Accessed 4 March, 2010]
  22. Glenn D. Israel "*Determining Sample Size*" (1992) Available at: <http://edis.ifas.ufl.edu/pd006>
  23. Kinney, S. T., and Panko, R. R. "*Project teams: Profiles and member perceptions-Implications for group support system research and products.*" In a Proceedings of the Twenty-Ninth Hawaii International Conference on System Sciences, Kihei, Maui, 1996
  24. Sabella, R. A., B. L. Booker. "*Using technology to promote your guidance and counselling program among stake holders.*" Journal of Professional School Counselling 6: 206-214, 2003.
  25. Van Horn, S. M., R. D. Myrick. "*Computer technology and the 21st century school counsellor.*" Professional School Counselling 5(2): 124-131, 2001