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Comparing the video conferencing and face-to-face conversation: Is video conferencing fit for purpose in facilitating supportive dialogue?

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Abstract

This project aimed to explore the difference between video mediated and face-to-face conversations in order to establish fitness for purpose in the support of health students. Findings suggest wider implications for use of the medium in health delivery. The project objectives were:

- To determine perceived differences between supportive conversations conducted via video link or face-to-face.
- To explore potential causes of any perceived differences between conversations conducted via the 2 different media.

Using mixed methods including dialogue simulation, transcript annotation, a questionnaire and focus group, participants' (n=9) perceptions of differences between the two media and causative factors were explored.

Participants expressed concerns over the use of video communication for emotionally based dialogue, citing this to be attributable to perceived problems with eye contact, interpretation of non-verbal communication cues, and limitations related to the two-dimensional nature of the video conferencing medium.

Reduced perceptions of shared space with two-dimensional communication; a phenomenon present in face-to-face dialogue, may explain participant discomfort with video communications. The author queries whether new, three-dimensional technologies may overcome this. Concerns are raised over the need for careful conception prior to the introduction of non-direct support/contact methods in the context of both education and health.

Key words:

Communication, video conferencing, student support, dialogue

Introduction

Within many health related Higher Education programmes in the United Kingdom, it is common practice for students to be supported within placements through visits from University staff (University of Brighton, 2009/10, Northumbria University 2008/9). However, these visits represent a significant economic cost.

Whilst advocated as good practice (e.g. Royal College of Nursing, 2002; Chartered Society of Physiotherapy, 2003) and supported by literature (Martin, 2005; Gillespie, 1997) the effectiveness of the face-to-face nature of most visits appears unsupported by research. Thus, in adhering to economic drivers, alternative equitable, quality methods for providing support need to be investigated. This project aimed to explore the potential for using video-based communications for student support, through investigation into the difference between dialogue conducted via video link and face-to-face. This project also has implications for wider applications of video-based communications technology.

Video conferencing

Much of video conferencing (VC) research within health care and education is over 10 years old. Collins et al (1999) conducted a pilot project (n=10) in social work education, investigating VC as a means of conducting placement

visits. The study indicated positive participant experiences but also highlighted problems with impaired eye contact, facial expression and body language, as potentially influencing the ability of VC to fulfil its purpose in student support. Abbot et al (1993) investigated the use of VC within distance learning; discussing participant anxieties over “having a camera pointed” at them and advocating time for familiarisation and experience prior to more extensive use.

Whilst suggesting potential difficulties with using the medium, neither of these studies have specifically addressed the causative factors behind identified limitations.

Video conferencing – the wider context

There is a much larger body of literature relating to the overall use of VC in health care and clinical learning.

Bednar et al (2007) undertook investigation into VC in facilitating learning in 3 orthodontic departments through interactive seminars. In comparing participation in clinical conferences, distance seminars and clinical seminars via high-speed internet connection with direct instruction, there was found to be little difference between distant or direct instruction. Findings did highlight instructor personality and teaching style as impacting upon participant comfort with video-based learning. Bednar’s findings, supported with other literature (e.g. Bertsch et al, 2007) advocate non-direct instruction as a potentially successful means of delivering future clinical skills teaching.

Authors such as Myers et al (2006), Damianakis et al (2008) and Huijgen et al (2008) cite the use of video-based communications for tele-psychiatry, virtual psychotherapeutic care givers groups and tele-rehabilitation respectively. These studies, like previous literature, demonstrate no reduction in outcome through the use of video. As a relatively new body of literature, the use of video-based therapy represents a cultural shift from traditional methods that perhaps reflects changes in our attitudes towards technology. However, further investigation into the intricacies of video vs. face-to-face interaction can only benefit service conception and delivery.

Crede and Sniezek (2003) and Hayward (2002) explored the role of VC for conducting traditionally face-to-face group activities, discussing the potential benefits of long distance meetings without travel, but citing decreased participant confidence in group decisions made via video link and a general sense of discomfort with the medium as needing consideration when planning VC based activities. In particular, Hayward's findings demonstrate a reduction in outputs within production-based activity, arguing that production tasks require greater social richness, more critical discussion, and more efficient use of subtleties in non-verbal communication. When applied to both education and to therapeutic applications, it can be seen that there is the potential for disadvantage in using this medium.

Within Higher Education, reports such as the Dearing report (Dearing, 1997) encourage institutions to engage with technologies in addressing cohort needs. VC and virtual learning potentially offer cost effective alternatives to face-to-face dialogue. However, without investigation into

perceived differences between VC and face-to-face media, the impact upon potential users of VC cannot be fully anticipated and participants may be disadvantaged as a result of a change in economic drivers. As such, this study's aims and objectives were established as below.

Research aim:

To explore video conferencing as a means of supporting students during placement based learning periods.

Objectives:

- To determine perceived differences between supportive conversations conducted via video link or face-to-face.
- To explore potential causes of any perceived differences between conversations conducted via the two different media.

Methodology

Study Design

This study was undertaken as an evaluative phase (Robson, 2002) of an Action Research cycle. The perceptions of participants were used as the focus of this study as literature identified a lack of difference in actual output resulting from the use of VC, but a continued expression of discomfort or dislike from those involved (Berger et al, 2009; Hayward 2002; Crede and Snizek, 2003).

As an insider researcher (Senge, 1998) and Practice Placements coordinator for Physiotherapy, the author had considerable prior understanding of the complexities associated with the support of Physiotherapy students during placement learning. Thus, the author used methodologies allowing exploration of participant perceptions; in contrast to cited literature that focussed primarily on evaluation of outputs.

Methods

A mixed methodology was used and ethical approval was sought and granted from the School Ethics committee for this project. The research project had a phased approach which sequentially involved initial conversations, transcriptions and comparison of these, online questionnaires and a follow-up focus group.

Sample

A volunteer sample was recruited (Physiotherapy = 8, Occupational Therapy = 2) from Operating Department Practitioner, Physiotherapy and Occupational Therapy year 3 (and year 2 pre-registration Master's) student groups (representing Professions Allied to Medicine). These students were felt to have the greatest experience of placement support. The average age of the group was 22.5 years; consisting of 20/21 year-old students (n=6), and four mature students, the oldest being 30 years old.

Objective 1 – Simulated dialogue

Participants were paired with another familiar student and were asked to undertake two 20 minute conversations, via randomly ordered video link and face-to-face means. These conversations took place within the Clinical Skills

Centre of the School. Each of the 20 minute conversations was recorded for later transcription. Prior to the conversation, participants were asked to individually consider two events from placements from which they had either learned a lot or that required support. Participants were instructed to discuss, in turn, one of each individual's considered events and to discuss management strategies or ways of further developing skills. Those situations not discussed then formed the focus of the second conversation.

Normal placement visits occur between a student and a known tutor. As such, an ideal research approach would be to mimic this. However, undertaking placement support via a new medium has the potential to disadvantage those involved, thus, raising ethical issues. In addition, as literature suggests tutors' VC skills may affect potential results (Mead, 2005; Susamma, 2005; Minocha and Roberts, 2008), simulation using pairs of students familiar with one another, was felt to offer the least intimidating and most natural environment.

Data Collection and analysis

All conversations were recorded and transcribed for conversation flow, in order to evaluate actual differences between face-to-face and VC media. In line with initiatives such as Wicaksono (2009), transcriptions were annotated for frequency of interruptions, long pauses and short pauses; representing interruptions, anticipated changes in speaker and pauses for consideration of topic respectively (Have, 2007). Recordings were independently annotated by the researcher and moderator using tally scores for each occurrence, and

then compared. Scores were recorded in an Excel workbook and subjected to 2-tailed t-test (Hicks 2002).

Objective 2 and 3 - Questionnaire

On completion of conversations, participants were asked to complete an online questionnaire. The questionnaire was split into three sections relating to:

- Participant background information and experience with video-based communications.
- Equity of content between the two media dialogues and occurrence of any external variables detrimental to the conversation.
- Perceptions of differences between the two media.

The created questionnaire was piloted for comprehension prior to use. The questionnaire used a combination of scale responses, open and closed questions. Quantitative questionnaire data was analysed with Excel Microsoft package. Section 2 and 3 collected qualitative data which was subject to thematic analysis broadly grouping comments into those relating to; body language, eye contact, self consciousness, dialogue flow and other (Aronson, 1994). Results from the questionnaire were used to generate themes for a follow-up focus group (Kumar, 2005). One male participant chose to withdraw from the study due to personal issues, independent of the study. This followed simulated conversations, thus, this individual did not complete the questionnaire.

Focus group

The follow-up focus group took place within the School, at a time to suit participants and lasted just over 1 ½ hours. The room size allowed for good group movement for sub-groups discussions and was quiet. Refreshments and lunch were provided.

- Participants were initially split into three groups of three for further discussion of areas identified from preceding questionnaires. Participant responses had suggested a negative perception of video based communications in comparison with face-to-face dialogue. Thus, the focus group were asked to discuss the following and to summarise their key discussion points: To explore why participants had perceived a difference between the two media.
- To identify what it was about video conferencing that was perceived to be detrimental to conducting a supportive dialogue.
- To discuss potential solutions to identified “problems” with video conferencing.

With the researcher as facilitator and “chair” the whole group were then asked to compare findings.

A record of focus group data through participant notes, researcher additional notes and overall notes of key emerging themes was kept (Kumar, 2005).

Focus group data was subjected to thematic analysis using the themes identified from questionnaire data.

Results

Online questionnaire

Table 1 outlines results from Section 1 (See appendix 1)

Questions 1 to 4

Of the nine participants, three had experience using webcams for communications (5-20 or > 20 times) with the remaining six having none.

Question 5 and 6 explored participants' perceptions of whether conversational content via the two media had been similar and whether they had been able to openly discuss material.

All participants indicated perceptions of similar content via the two media. Participant 6 (P6), though not indicating this as detrimental, highlighted perceptions of partner dominance in the conversation, indicating how this made the task of comparing experiences more difficult.

Questions 7 and 8 explored any technical difficulties that were detrimental to either communication or dialogue flow. Three of the nine participants had identified difficulties:

- *P5 - "Occasionally the screen would freeze for a moment which disrupted the flow of the conversation".*

- P6 - *“I could hear my voice reflected back at me with a delay so I think the sound may have been too loud”*.
- P8 - *“There was a time delay which made it difficult to judge when someone was going to contribute to a conversation”*.

These comments suggest ongoing technical issues that have been previously identified in a recent pilot study (Taylor, 2009).

Question 9 and 10 asked participants to consider whether conversations were more easily conducted via one of the media and to identify differences between the two. All participants indicated face-to-face to be easier for conversing. One participant stated that whilst face-to-face was easier due to familiarity, they had not perceived any difference between the two conversations. The remaining eight identified differences broadly categorised into three themes:

- Difficulty maintaining eye contact resulting in reduced flow of dialogue.
- Perceived increase in length of pauses, thus, making conversations via video appear longer.
- Being aware of their own image, the movement of their hands and their posture on the screen, leading to self-consciousness.

Questions 11 to 13 asked participants to indicate aspects of communications via video link that had influenced their communication, or been detrimental or beneficial to their discussions. Using thematic analysis

broad themes of response were developed. Quotes given below are not inclusive, but examples of participant comments:

Eye contact

Three participants (including one with prior experience of VC), commented on the influence of VC on eye contact, affecting dialogue:

- *P7 - “I found myself looking at the screen rather than the camera which meant I found eye contact was really reduced”*
- *P10 - “I found it difficult to read my partner as I didn’t know whether she didn’t want to make eye contact or whether she had difficulty with the camera”*

However, a fourth participant (also with prior experience of VC) recorded expressions of surprise at how alterations in eye contact did not affect dialogue.

- *“I thought that lack of eye contact would be detrimental to communications but in reality we were still able to easily discuss difficult situations that happened on placement....”*

In the researcher’s experience, VC does alter eye contact. That two of the commenting participants have previous experience of video-based communications, suggests a need for further exploration of the role of eye contact in conversation and the effects on dialogue via other video-based communications.

Body Language

Four participants (including two with prior experience) identified issues relating to non-verbal communication:

- P1 - *“Face-to-face is easier as you can see the other persons facial expressions and body language where as video conversation seems distant.”*
- P6 - *“face-to-face felt more personal and non verbals were much easier to pick up on”*
- P2 - *“the person opposite me on the video link didn’t move much and neither did I... face-to-face was much more animated”*

Potential causative factors for the above were explored in the follow-up focus group.

Self consciousness

The researcher was aware that some colleagues, particularly those with no experience of VC, were concerned about self-consciousness in using it. Four participants, including two with prior experience of VC communication, discussed feeling self-conscious when conversing via video link.

- P7 - *“.....I was slightly distracted by seeing myself on screen. I became aware of my hand gestures and posture.”*
- P2 - *“because I didn’t feel as able to move around, I think it stifled my communications a bit. I don’t think the content changed, but the*

enthusiasm for a subject area was difficult to portray and I feel like I tried too hard.”

- *P8 - “I was conscious of the camera. I could see myself on the camera – that’s not good”*

Further discussion within the follow-up focus group, centred on causation of alterations in dialogue resulting from the medium, rather than effects.

Dialogue flow

Five participants’ comments related to influences on dialogue flow.

- *P6 – “..... I felt that it made my conversation more one sided as it was difficult to judge when the other person was going to contribute.”*
- *P8 - “it felt more time consuming and less flowing than the face-to-face chat”*
- *P3 - “It was a little bit more difficult to start the conversation again, and I felt more pressurised to think of a conversation topic to end the pause.”*

Annotation of transcripts

Results from the annotation of transcripts are indicated in Table 2.

Table 2: This table indicates the frequency of occurrence of long pauses, interruptions and short pauses recorded by the researcher (R) and moderator (M) on independent annotation of face-to-face (F2F) and video-based (vid conf) conversation transcripts. Numbers indicate participant identity.

Participant conversations	Long pauses		Interruptions		Short pauses	
	R	M	R	M	R	M
1 & 2 vid conf	2	2	19	19	16	16
1 & 2 F2F	0	2	10	10	9	10
10 & 8 vid conf	0	0	5	5	3	3
10 & 8 F2F	1	0	3	3	3	2
3 & 9 vid conf	0	0	5	6	4	4
3 & 9 F2F	0	0	4	5	3	1
4& 5 vid conf	1	2	14	16	14	13
4 & 5 F2F	1	1	12	10	9	10

6 & 7 vid conf	3	2	31	31	14	15
6 & 7 F2F	1	1	32	35	21	19

A 2-tailed t-test was performed using Excel to compare results from face-to-face and video-based conversations. The following p values were obtained for data relating to occurrence of long pauses, interruptions and short pauses respectively: 0.2302, 0.2273, and 0.4987. No significant difference was found between the data sets for face-to-face and for VC based conversations, most likely due to the small sample size (Robson, 2002). However, observations by both annotators indicated the following:

- In all transcriptions there appeared to be an initial pause effect that reduced approximately five minutes into each transcript. This suggests a period of adaptation to the artificial environment and circumstances.
- Of those conversations with more interruptions recorded, more interruptions were seen within the face-to-face conversation. This suggests that those who interrupt naturally more often do so more in a face-to-face environment than via video link.
- In conversations where individuals appeared more reserved and measured in their speech, there were less interruptions within face-to-face dialogue than with video link. It is queried whether there is less confusion for these individuals associated with face-to-face speech though it is recognised that this is an interpretation without substantiation.

Whilst not statistically supported, these observations are felt to offer potentially useful information for any future application of VC.

Focus group data

The group discussions focused on the following areas:

- Why did the group as a whole identify a difference between the two media?
- What might be the causative factors?
- Are problems associated with a lack of experience?
- What may cause problems if video conferencing were to be used for midway placement visits?

On completion, recorded comments and discussion areas were analysed and the following themes identified:

- The impact of Video Conferencing on self
- Issues relating to observation of non-verbal communications
- Logistical issues associated with the use of video conferencing technology

The impact of VC on self

All participants perceived a difference between the two media, with discussion centring round the impact of the video link on self-confidence and on comfort within the conversation. The whole group concurred with sub-group comments, discussing a general dislike for the visual nature of the video link.

- P1 - *“Video link forces you to look at someone, that’s not natural, it’s too focussed”.*

Other participants developed discussion around the dislike of viewing themselves during a conversation.

- P7 - *“it’s difficult using a video link as there are distractions... like I was wondering what I look like on the screen – this made me self conscious”*
- P8 - *“Is it possible to hide your own view so you don’t have to look at yourself?”*

Individuals speculated on how this might be worse, or different with a lecturer present. two individuals spoke about how placement visits were always stressful under failing or difficult circumstances, as discussing feelings and problems with anyone, “let alone a guidance tutor” was difficult. Both individuals felt that using a video link could make a bad situation worse by placing stress on a student already upset, through the use of an uncomfortable medium. Both commented that a telephone call would be preferable due to an ability to hide the situation, rather than a preference for this as a supportive medium.

- P2 - *“I would prefer a telephone call as you’re not on show” “...I don’t like to hold emotional conversations very much and I find them difficult. So, I wouldn’t like a video conferencing visit if I had a problem as it would be more difficult to hide emotionally as you could see me.”*

- P8 - *“If you’re upset, video conferencing lays you bear.”*

The group discussed the potential to miss arising problems or to miss the need for further support via telephone-only contact. This highlights an important consideration for non-direct support methods.

Discussions then arose concerning how a video-based dialogue may be awkward under difficult circumstances.

- P5 - *“the video link highlights the awkwardness of the situation when you have nothing to say...”*
- P6 - *“I’m not sure how the lecturer would manage if they had to try to comfort someone via a video link”*

This comment generated more comprehensive and insightful discussion relating to the cause of perceived problems in using VC for student support for emotional issues.

- P6 - *“the video link really feels like it creates a conflict.... if I’m talking to someone upset on the phone, I can use the things I say and the way I say it to make them feel better. If I’m with them, I can hold hands out to them, touch an arm and things like that.... when I’m on the video link, I feel like I should do the tactile thing because I’m face-to-face but can’t because I’m not really. It sort of creates a conflict and I don’t know what to do”*

All group participants discussed how video-based communications generate a perceived artificial environment resulting in discomfort, with concerns from those with experience that familiarisation with the medium may not overcome this problem. In addition, two individuals suggested that the use of the telephone for emotionally based conversations was preferable due to familiarity with the process of comforting another via the medium.

The group concluded that whilst general conversations, information sharing and decision making could be supported by the medium, the intricacies of emotionally based communications could not be fully replicated through the use of a two-dimensional (2-D) communications medium, with a number of technical flaws that reduced the efficacy and flow of dialogue.

Observation of non verbal communications

All participants commented on the impact of the VC medium on the ability to view or interpret body language.

Interpreting body language

Participants discussed the fact that movements on screen were either limited or difficult to see, with one participant suggesting this being due to reduced movement in order to stay within camera shot, thus, impacting upon individual non-verbal communication during conversation.

- *P4 - “you need a ½ body view so that you can see what their hands are doing as well as their face”*

- P2 - *“It’s weird and uncomfortable cos the other person on the other end doesn’t move, at least my partner didn’t”*

One sub-group discussed how one individual experienced in webcam use for conversations with family in New Zealand, felt much more comfortable whilst sitting on her bed. She felt that video-based conversations were better with people that she knew well and within comfortable settings.

- *“It’s not perfect but it’s comfortable and I can be doing my nails and things when I’m talking so I’m much more relaxed so it’s easier...”*

Possibly due to a reduced need for eye contact, this reflection suggests limitations in the use of video for unfamiliar dialogue.

Two-dimensional media

Discussion progressed to consider the 2-D nature of VC. Two participants discussed difficulties in seeing subtle forward/backward movements that indicated cessation of speech. All participants agreed and debated the role of small “tells”, and how confidence in interpreting pauses reduced due to inability to match subtle body language with verbal communication.

- P3 - *“It’s really difficult to know when someone has finished talking ..I kept having to double check....when they pause, I can’t see if that means they’ve stopped or have just stopped to think....”*

- P4 - *“you can’t see the full body language.....you miss small, subtle movements that indicate a conversation...”*
- P6 - *“yes, things like eye contact, tapping a pen or moving slightly forward in your seat...you can’t see these cos it’s like 2-D...”*

Logistical issues

Logistical issues identified in previous studies (Taylor, 2009) appeared to remain a problem for this study.

- P2 - *“looking up at the camera is not good, it’s not a natural position”*
- P6 - *“It would be better on a computer screen like a laptop rather than the big screen”,*

Thus, it is suggested that the positioning and equipment required for any video-based therapeutic or educational venture, will need careful consideration in advance of the purchase of relevant technologies or space.

In addition, a number of comments indicate a need for careful consideration of confidentiality:

- P8 - *“I was worried that I’d be overheard if I was saying something sensitive. Also, I couldn’t tell if there was anyone else in the room at the other end”.*
- P3 - *“I would prefer using a headset rather than the microphone, it’s more private and I think there are safety issues around others listening in”*

- P7 - *“there were loads of things.....do I look at the screen, at the students waiting to get in to the classroom next door or at the camera....”*

These comments make clear the perceptions of participants involved that the use of this medium may compromise the confidentiality of the support system. However, whilst concerns were raised within the focus group, the group overall were positive about the benefits of VC to student support in the event of staff illness or shortage, citing “something being better than nothing”.

Participants successfully identified a number of clear perceived differences between the two media and explored the causative factors behind these.

Whilst discussions centred on its use in the support of students during placement based learning, the findings of the study are not felt to relate solely to this purpose.

Discussion

Limitations

A number of limitations to the study were identified: Whilst the use of a small volunteer sample limited the study, attempts to reduce inherent bias through full informed consent and appropriate incentives were made. Participants received printer credit and book vouchers in exchange for their time.

Prior participant experience of using VC presented a potential bias risk to the study, thus, this was included as a question in the questionnaire. In addition, issues relating to insider research were of concern, with bias risks

relating to the description, interpretation or theory of what is observed/found (Robson, 2002) present within the study. Reflexivity techniques (Ahern, 1999) were used to identify internal risk factors with the following resultant actions taken: Participant notes in addition to formal researcher interpretations, formed the basis of the focus group record: "Findings" from the focus group were checked by participants for accuracy (Robson, 2002).

Understanding communication

Participants from this study identified issues associated with reduced eye contact, difficulty viewing non-verbal cues, discomfort, reduced confidence and affects on dialogue flow whilst conversing via video.

Eye contact

The findings of this study concur with those of an earlier study by Mead (2005). In a study investigating teaching of Latin to 16 year-olds via video link, participants identified an inability to pick up on subtle expressions such as glazed over eyes, subtle movements or sudden avoidance of eye contact that indicate lack of comfort or understanding. Mead suggests resultant formal communication with reduced attempts to interrupt, formalised turn-taking for discussions and verbal clarification of dialogue. In addition, Ishii and Kobayashi (1992) present gaze awareness as being vital in indicating participant focus or attention. As equipment positioning can exacerbate problems with gaze awareness, this aspect may be responsible for concerns over privacy and confidentiality expressed within this study.

In the context of supportive dialogue, the potential to miss indicators of discomfort or to mis-interpret gaze indicators, may threaten the validity and reliability of the medium. Thus, there is the potential for interpretation of the key message to be altered.

Body language

Esposito et al (2001) and Harper and Shriberg (2004) discuss the role of both verbal and non verbal cues used in conversation to clarify meaning, indicate cessation of speech and resolve ambiguities. Esposito et al suggest a need for accurate combinations of non-verbal and verbal communication in clarifying meaning. Harper and Shriberg, in modelling normal human speech, concur, suggesting a greater number of knowledge sources (i.e. gesture, hand position, verbal speech etc) increases accurate meaning conveyance within dialogue. Thus, it is suggested that VC may be limited in some contexts due to the potential for mis-communication or mis-understanding.

Discomfort with the medium

Participants of this study highlight perceptions of discomfort with the VC medium, a phenomenon echoed in earlier literature. A paper by Brick et al (2009) investigating the potential for using low bandwidth three-dimensional (3-D) video conferencing for communication may explain this.

Unlike 3-D VC systems which use multiple cameras to create a 3-D image, Brick et al use an understanding of motion parallax to create a low bandwidth picture that mimics a 3-D image. Motion parallax is the method by which humans gauge distance from objects, using the rotational component of

vision in order to develop a three-dimensional perception (O’conail et al in Brick et al). Brick et al discuss the importance of this in establishing a sense of common presence or shared space, which is fundamentally altered through the use of a “standard” 2-D medium. Barfield et al (in Brick et al), identified a significant improvement in user experience through 3-D systems than with traditional 2-D.

Also supported by literature within the computer gaming field (Lombard and Ditton, 1997), perceptions of an absence of shared space, in combination with an inability to accurately use verbal and non-verbal communications strategies, may contribute to participant discomfort within this study.

Actual differences

Whilst significant differences between VC and face-to-face dialogue were not found, observed differences suggest the impact of VC may vary with the individual. Rogers and Jones (2006) investigated conversations conducted between individuals with dominant and without dominant personality traits. Their findings suggest dominant individuals to be significantly more successful at interruptions than non-dominant individuals when using VC. Barrett et al (2008) in investigating prosodic signals in conversation, found that they were used to initially interrupt and then secure a turn at speech. This supports observations from this study of differences in interruption frequency between transcribed conversations. It is suggested that individuals who tend to interrupt frequently within dialogue may need more

interruption attempts prior to a successful change in speaker, thus, individuals who naturally interrupted during face-to-face dialogue, did so even more via a video link.

Conclusion

The findings from this study and literature discussed above, highlight limitations of VC in this context and suggest that application to education and health may require further research in order to explore ways of managing the identified issues, and to maximise the ability of the medium to meet the needs of individual students.

This study has, however, been in the context of simulated placement discussions. Thus, it is the author's intention to further investigate this topic in a more authentic context, as the basis for a larger scale project, investigating the role of physical presence in education and student support.

In 2005 Susamma advocated the need for clear guidelines for institutions using video-based communications for education, relating to the manner of delivery and the choice of use for this medium. These included lecturers not moving too much and pausing for longer to indicate cessation of speech. However, considering its wider use, such guidelines are not always realistic. In light of advances in technologies including 3-D and holographic imagery and those that utilise user friendly products and interfaces (e.g. Apple products), the coming decade is likely to be one of significant change in the way in which education and healthcare is delivered. As a cost effective and on-demand alternative to face-to-face discussion and long distance

travel, communications via these methods may offer innovational opportunities in the support of health and learning.

As the advent of 3-D tele-visual systems becomes topical, the ability of this technology to overcome the limitations of 2-D predecessors, and in particular address issues of shared space perception, requires investigation. In a society with an increasing emphasis on “duty of care”, participant perceptions regarding the ability to “hide” emotional problems via non-direct support methods suggests, in the author’s opinion, that care needs to be taken when implementing alternatives to face-to-face communications. Careful planning may be required if the warning signs of struggling students or those developing for example, mental health issues, are not to be missed.

Appendix 1

Table 1: Participants (n=2 female Occupational Therapy students, 2 male and 5 female Physiotherapy students) were asked indicate their level of experience with video-based communications, whether they perceived equity of content between the two conversations conducted and whether any technical difficulties occurred. For further details, please refer to relevant sections in text.

Question	Reply
Did participants have previous experience of video conferencing?	Yes = 3 No = 6
If yes, how much experience?	5 -20 times = 2 > 20 times = 1
If no, please indicate whether prior to this study, you had an interest in the use of video-based communications	Yes = 1
Did you feel that the conversations via video link and face-to-face covered similar content – this does not mean the same topic, just the same type of material?	Yes = 9
Did you perceive any restrictions to communications due to problems between you and your conversation partner, for example, personality clashes, different approaches to learning etc?	No = 8 Yes = 1
Were there any technical issues arising that interfered with your ability to complete the conversations that you were asked to	No = 6 Yes = 3

undertake?	
Did you experience any technical difficulties that interfered with the development of your conversations?	No = 6 Yes = 3

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