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Moderating Cultural Effects in a Higher e-Education Context?

Supervisor's Tone of Voice in Recorded Audio Feedback

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***Abstract*—Providing feedback to learners on their writing assignments is one of the most important and time-consuming tasks that a supervisor performs. In e-Education environments, especially in the case of distance learning, giving feedback becomes more challenging because there are often no opportunities for face-to-face interaction. Typically, a supervisor provides comments to learners in written form via email; however, the use of recorded audio feedback (RAF) in e-Education environments has become a viable alternative. This work in progress reports on learners' perceptions of RAF in a multi-cultural higher e-Education context. Our observations indicate that learners tend to have positive feelings toward RAF and that RAF potentially moderates cultural effects. The observations are discussed in light of the relevant literature, and future research questions are proposed.**

Keywords—multi-cultural, cultural dimensions, recorded audio feedback (RAF), e-Education, culture-neutrality

I. INTRODUCTION

Providing feedback is an essential part of the teaching and learning processes, and it can be utilized by learners to enhance their future academic performance [1, 2]. Effective feedback needs to (a) explain what progress is being made toward the study goal or study objective, (b) explain how the learner has performed, and (c) provide advice to help the learner improve [3, 4]. The increasing use of technology-based e-Education environments and tools in higher education promotes the development of new approaches to enhance the methods and the quality of feedback given to learners [5].

Formative feedback concerns development, improvement, and learning, whereas summative feedback concerns accountability and performance [3]. Summative feedback evaluates a person's learning at the end of an instructional unit by comparing it against some standard or benchmark. Recorded audio feedback (RAF), the present research interest, is one method of providing feedback that is becoming increasingly popular, especially in e-Education. RAF can be defined as formative and/or summative messages that are recorded and distributed by supervisors as digital audio files to individual learners or learner groups in response to both on-going and submitted work [6].

Our research interest in RAF specifically relates to the multicultural nature of higher education, which requires supervisors and instructional designers — especially those working in e-Education environments — to be culturally aware when they deliver instruction and feedback and assess their students. In effect, culture has been stated to be a challenge in the multi-cultural e-Education context in our field of engineering and computing education [7, 8].

We report on a preliminary study on the use of RAF in a multi-cultural e-Education setting. Based on our findings, we are proposing that cultural dimensions could be moderated in e-Education by using RAF. We begin by reviewing literature on the cultural dimensions of e-Education and on the use of RAF in Sections II and III. Our study and preliminary findings are introduced in Sections IV and V. Finally, we discuss our future work and propose research questions in Section VI.

II. ON CULTURAL DIMENSIONS IN THE CONTEXT OF E-EDUCATION

Culture is embodied in how people interact with other individuals and with their environment; it is a way of life formed under specific historical, natural, and social conditions [9]. In Parrish and Linder-VanBerschot [7] work, eight cultural dimensions were outlined in the higher education context. We can divide these dimensions into three main categories that are most likely to affect e-Educational situations and affect the learning process:

- social relationships: (1) equality and authority, (2) individualism and collectivism, (3) nurture and challenge;
- epistemological beliefs: (4) stability-seeking and uncertainty acceptance, (5) logic argumentation and rationality, (6) causality and complex systems; and
- temporal perceptions: (7) clock and event time, (8) linear and cyclical time.

These cultural dimensions integrate the three main cultural models: Hall's model [10], Hofstede's model [11], and Lewis' model [12]. We are especially interested in Lewis' model because it focuses on multi-cultural communication. He has

divided the world's cultures into three rough categories: (1) linear-active cultures, (2) multi-active cultures, and (3) reactive cultures. Linear-active cultures plan, schedule, organize, pursue action chains, and do one thing at a time. Members of multi-active cultures are lively, loquacious people who do many things at once, planning their priorities not according to a time schedule but in accordance with the relative importance of each appointment. Reactive cultures prioritize courtesy and respect, listening quietly and calmly to their interlocutors, and reacting carefully to the other side's proposals.

As more and more higher education activities are performed online, learners have become global and widespread rather than local. The boundaries separating cultural groups are blurred. In effect, 21st-century training and content providers and educational institutions would like to promote a shift towards more culture-neutral e-Education [13]. This is a challenge because culture not only affects how we behave and think but also how we learn [14, 15]. Our research interest lies in the tension between the two extremes of culture-sensitivity and culture-neutrality. We are interested in moderating cultural effects and in developing a more culture-neutral approach to feedback procedures.

III. RAF IN LITERATURE

Much research has focused on feedback and assessment in higher education, and recently also on the use of audio feedback [16–18]. The general results of this research reflect learners' needs, expectations, and experiences of feedback. The timeliness of feedback is crucial, and it should be thorough, constructive, and supportive, offering guidance and encouragement. It should be reflective and encourage reflection. Finally, clarity is vital, and supervisors should use uncomplicated vocabulary when giving feedback.

Several studies have found that most learners and supervisors have an overall positive attitude towards RAF [19–23]. The underlying reasons for this attitude given in these references include the following: (1) Audio feedback means more feedback; a supervisor can say a lot more in five minutes than they can write in the same amount of time. (2) Audio feedback means clearer feedback; more detail means less ambiguity, and speech can communicate meaning beyond the words. (3) Vocal emphasis and variations of pace can focus attention on the most important or complicated aspects. (4) Audio feedback feels "more personal" than written feedback. The supervisor's voice can convey interest and engagement in the learner's work and can allow the supervisor to deliver negative or critical feedback more tactfully.

Altogether, most of these RAF studies have been carried out in classroom settings, where audio feedback is easy to explain afterwards through face-to-face communication. New challenges occur in e-Education environments with distant and multi/cross-cultural learning contexts, where synchronous communication is seldom possible.

IV. OUR STUDY

A preliminary study was carried out at the University of Jyväskylä (JYU) in the Faculty of Information Technology (Finland) and at the Keio University Shonan Fujisawa Campus (SFC) (Japan) in 2015–2016. The case course was an advanced level course in requirements engineering (RE) related to software development, and instructed by a Finnish teacher (the first author). A requirement is defined as a condition or capability to be met or possessed by a software system to satisfy a contract, standard, specification, or other formally imposed document [24]. A well-formed requirement is a statement of the system functionality that must be met or possessed by a system to satisfy user needs or objectives and that is qualified by measurable conditions and bounded by constraints [24]. RE contains a set of activities for discovering, analyzing, documenting, validating and maintaining a set of system requirements. It is divided into two main groups of activities: requirements development and requirements management. The development includes activities related to discovering, analyzing, documenting, and validating requirements, whereas the management includes activities related to maintenance, status tracking, traceability, and change management.

The e-RE course is a web-based course implemented in the Optima e-Education system [25]. Progressive inquiry is applied in the course as a pedagogical model [26]. Learners submit their assignments to a return box in the e-RE course working space. The supervisor prepares the RAF files with Optima's create audio file function and defines the access rights to a certain learner or a learner group. When the RAF is ready, a notification email is sent to the learner or learner group.

The e-RE course consists of three phases that form a cumulative process. Each phase has a theoretical and practical component. After each phase, learners submit an assignment, and the supervisor evaluates it and gives feedback on how to proceed. In our study, the feedback was thus given in three phases: (1) feedback in written form by email, (2) feedback in written form by email and RAF, and (3) feedback only by RAF.

The survey respondents thus gained experience with these different feedback procedures. They were invited to participate in the web-based survey for the RAF study. A total of 64 learners out of 75 (85%) completed the survey. The target groups included learners from Finland (45) and Asia (19) (Japan, Malaysia, Thailand, Indonesia, and Vietnam). The study was exploratory and did not include an experiment based on control groups. Moreover, the study did not differentiate between the Asian countries; because of this and the small sample size we do not present indicators of significance but concentrate on deriving future research hypotheses that can inform a more controlled research design.

V. FINDINGS

Most of the learners had a positive experience with RAF, and thus the results are in line with the findings presented in the RAF literature. With RAF, feedback that is more detailed can be given, and learners can listen to it more than once and on their own time. The learners felt that RAF was easier to understand, more detailed, more motivating, and more personal than written feedback. A total of 38 out of 64 learners (60%) preferred a combination of RAF and written feedback, and 26 learners (40%) thought that RAF feedback alone was sufficient. According to the learners, combination feedback should consist of written main points (in the form of a bulleted list) sent via email and a more detailed explanation via RAF. They stated that the suitable length for RAF was 5–10 minutes. Both one audio

file clearly indicating the points in the document (for example: page three, second paragraph, third line) and several audio files embedded in the PDF document in various locations were considered to be equally good options.

Learners were also asked to identify what they considered to be the three most important aspects of RAF. They rated explaining misunderstandings, demonstrating correct practices, and suggesting approaches for future assignments as the most important topics. We also asked them to describe the best way to structure RAF. According to the answers, the best structure is as follows: (1) general comments concerning the whole document, (2) section/paragraph-by-section/paragraph comments, (3) summary of the next steps, (4) critical comments, and (5) appreciations.

Concerning the supervisor's tone of voice in the RAF, the learners most commonly chose the personal (rich nuances) option over the formal (very polite) or natural (no expression of feelings) option. In addition, around 80% of the learners thought that the tone of the supervisor's voice could convey whether the changes to be made were major or minor. We thus found that the supervisor's tone of voice in RAF was an important issue for learners, and this importance seemed to be independent of culture. In addition, the supervisor got fewer follow-up queries over the given audio feedback than over written feedback.

Furthermore, the survey included seven statements, each one with two options measuring cultural dimensions. The formulation of the statements was based on [7]. The first statement included the following options: 1a: "In the RAF, the supervisor states exactly how you should correct your assignment," and 1b: "In the RAF, the supervisor proposes how you could improve your assignment." The first option was supported by 53% (10/19) of the Asians and by 47% (21/45) of the Finns, and the second one by 47% (9/19) of the Asians and by 53% (24/45) of the Finns. Thus, the options were fairly equally supported, with no observable cultural effects.

The second statement included the following options: 2a: "After you have listened to the RAF, you adjust to the supervisor's comments," and 2b: "After you have listened to the RAF, you would like to express your own point of view." These options were also fairly equally supported, again with no considerable cultural effects: 2a: 42% (8/19) of the Asians and 51% (23/45) of the Finns, and 2b: 58% (11/19) of the Asians and 47% (21/45) of the Finns. Both statements were related to the concept of authority in cultural models.

The third statement revealed some differences between group-oriented and individual-oriented societies, another cultural dimension measured in cultural models. The statement 3a, "In group RAF, praise will be given to the whole group," was supported by 74% (14/19) of the Asians and by 36% (16/45) of the Finns. The statement 3b, "In group RAF, praise will be given to the best learner," was supported by 26% (5/19) of the Asians and by 64% (29/45) of the Finns. It seems that in our small sample Asian societies preferred the appreciation of the whole group.

The option 4a, "In learning activities, the focus is on getting the right answer, ambiguity is to be avoided, supervisors are expected to have right answers," was supported by 21% (4/19) of the Asians and by 38% (17/45) of the Finns, whereas the option 4b, "In learning activities, the focus is more open-ended, like discussions and project work, ambiguity is a natural condition, and the supervisor can say, 'I don't know'," was supported by 79% (15/19) of the Asians and by 62% (28/45) of the Finns. The fourth statement indicated some minor differences between attitudes toward authority in Finland and Asian countries.

The options of the fifth statement on epistemological beliefs were equally supported. The option 5a, "In learning activities, there is a focus on logical argumentation to find truth and an insistence on single truths based on logical reasoning; debate and argumentation are learning activities; being right is the most important," was supported by 47% of both Asians and Finns. The statement 5b, "In learning activities, there is a focus on achieving practical and socially acceptable outcomes and an acceptance of multiple truths based on experience; consensus building is a learning activity; being virtuous is the most important," was supported by 53% of both Asians and Finns. No observable cultural differences occurred, which conforms to the observation of minor differences in epistemological belief-related options 4a and 4b.

The sixth statement on cause–effect versus situational means of thinking showed differences between Finnish learners and Asian learners. The statement 6a: "Learners are expected to be goal-oriented; knowledge is tied to 'cause-and-effect' explanations, and there is a focus on stable knowledge and rules" was mostly supported by Finnish learners: by 11% (2/19) of the Asians and by 62% (28/45) of the Finns. The statement 6b, "There is more willingness to work within situational constraints; knowledge is tied to explanations of systems and situations and there is a focus on evolving and situational knowledge," was mostly supported by Asian learners: by 89% (17/19) of the Asians and by 38% (17/45) of the Finns.

A similar situation arose between the options of the seventh statement, which was related to the concept of time. The option (representing a linear time concept) 7a: "Time is to be managed; learning proceeds along a linear path with clear prerequisites and milestones; goal-setting is essential to learning; opportunities are not to be wasted; chances do not present themselves twice; the past is irrelevant, and future goals are important," was mostly supported by Finnish learners: by 37% (7/19) of the Asians and by 69% (31/45) of the Finns. The option (representing a cyclical time concept) 7b: "One adapts to time; learning is seen as practice towards slowly increasing perfection; goals are secondary; one adapts to the situation to draw from it as much as possible; time exists for observation and reflection; rushing is counter-productive to achievement because time is a series of cycles; opportunities recur, and when they do, one may make wiser decisions; the past is influential because cycles repeat; one carries the past forward; repetition is valuable for learning," was mostly supported by Asian learners: by 63% (12/19) of Asians and by 31% (14/45) of the Finns.

Based on the literature and our preliminary observations here, we conclude, first, that RAF may have the potential to moderate the effects of cultural dimensions. Second, the minor differences surrounding agreement with particular statements (see statements 4 and 5) perhaps indicate that boundaries

separating cultural groups can be unclear (cf. globalization). Third, in some cases, cultural differences seem inevitable. We need more accurate data and bigger samples to make claims about the extent of cultural effects within specific cultures; we hope that these hypotheses help in designing such a study. Our particular interest is based on our observation of both Asian and Finnish learners favoring RAF and some statements indicating unclear cultural boundaries. Accordingly, the following section outlines a research design that incorporates the potentially culturally-neutral feature in using RAF.

VI. Future Work

For a future study, we propose the following hypothesis: cultural effects could be moderated with supervisor's tone of voice in RAF in a multi-cultural e-Education context. Our focus is on the field of engineering and computing education. To investigate this hypothesis, we will incorporate three different cultures which differ and are accessible through our university collaborations: Finnish, Irish and Japanese. The patterns of speaking and listening in our test cultures are as follows:

Finland: Finns believe in saying only that which is absolutely necessary. Like the Japanese, they do not really trust words. If their original proposal is considered unclear, they repeat it in summarized form, assuming that this is the best route to clarity. Being reactive by nature, Finns encourage others to speak first and respond carefully and usually after a pause. Finns value silence and will often use this when communicating as a sign of respect, without negative meaning. Statements are regarded as promises and are therefore delayed until the speaker is sure of his or her intentions. Finnish communication is typically frank and direct; exaggerated or emotive content and rhetoric are not welcomed and are sometimes seen as inappropriate or even comical. Finns are amongst the world's best listeners and are trained not to interrupt. Concentration levels are high. They may give little or no feedback. Active listening (showing interest and involvement in the conversation) is rare and this is often troubling to other nationalities interacting with Finns. [27–30]

Ireland: lrish people speak in a more animated manner than the English and have been described as "audacious in speech." This audacity sounds exaggerated and should be taken into account when conversing with them. Warmly informal at all times, the Irish are great improvisers during discussions and resemble the Italians in their skill at showing apparent agreement and compliance. They are definitely more poetic and philosophical in speech than the English and have an unusual turn of phrase. When listening, the Irish are courteous and attentive and rarely show open dissent. They often have a strong desire to interrupt (as they are bursting with ideas), but rarely do so. Their feedback is ample enough, but occasionally is rather ambiguous. [27–30]

Japan: Japanese is a rather vague language, and the impersonalization of the verb, combined with the complex system of honorifics, can sometimes result in a certain ambiguity. There are established phrases that are used on specific occasions, and meaning is often hinted at instead of stated directly. The manner of speaking is more important, and the Japanese can create a very harmonious atmosphere with a very small number of words. When asked a question, the Japanese rarely launch into an immediate answer. As a reactive culture, they wish to evaluate the implications of the question carefully and think about their response. They pay careful attention to what is being said and will listen with patience and in silence, as it is not usual to interrupt or ask questions until the end. Japanese people will rarely ask for further explanations, as this might be considered impolite. Silence is not a negative sign in itself; it usually means that the person is concentrating or reflecting on what is being said. If eyes are closed during a meeting, this again shows that the person is listening intently. [27–30]

Our further research question is the following: Even if RAF is a culturally neutral measure, are there nevertheless barriers to *adopting* RAF? For instance, we could think that the tendency of Finns to be reserved in giving feedback and their seemingly inactive listening might create barriers. On the other hand, we speculate that the informal and improvising communication style of the Irish might feel ambiguous across cultures. As an aside, we note that diversity may also create barriers regarding different disciplines. In particular, computer science and software engineering scholars may willingly address feedback by developing software in place of more dialog-centered RAF. This observation particularly concerns the tradition of automatic assessment of learners' work. On these grounds, we see a necessity for further research on RAF.

We conclude by proposing a culture-neutral structure for RAF. It starts with a general part, which is followed by a course-dependent part. It is also very important to explain to learners that the RAF structure is culture-neutral. To remind, the supervisor can embed semantic information with his or her tone of voice in RAF: the supervisor can be caring, present, encouraging, critical, etc. Our first proposal for the RAF structure, grounded on the learner feedback outlined in Section V, is as follows: course name and code; feedback phase in case RAF is given in several phases; supervising teacher; learner/learner group; assignment objectives and evaluation criteria; message for the learner/learner group; MODULE_1: meta-level RAF including comments that concern the assignment as a whole; MODULE_2: middle-level RAF including comments that focus on ideas and the evidence supporting them, as well as how the ideas were expressed at the paragraph/sentence level; MODULE_3: micro-level RAF including all the basic technical issues of writing and referencing sources; MODULE_4: criticism; MODULE_5: appreciations of learners' work; MODULE_6: discussion and advice at the general scientific level.

We hope to have motivated more research on use of RAF in e-Education context, particularly its culturally neutral effects.

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