Using Recorded Audio Feedback in Multi-Cultural Higher e-Education: How do Academics Experience? A Thematic Network Analysis

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Abstract. The aim of our study is to shed light on how academics experience using recorded audio feedback (RAF) as a feedback method in multi-cultural higher e-Education context. We adopted a qualitative content analysis approach, applying thematic network analysis to the data received from three academics (a case study). This approach proposes graphical networks as an aid for analyzing and synthesizing qualitative data into basic, organizing and global themes. The thematic network analysis produced two global, six organizing and 48 basic themes. The two global themes were named "Speaking style" and "Culture neutrality/sensitivity". Based on our analysis, academics can, by using RAF in multi-cultural e-Education context, provide learners neutral and caring feedback. Culture neutrality in RAF treats all learners equally and culture sensitivity in RAF promotes learning and progress taking learners' diversity into account. Based on our analysis we introduce a preliminary RAF process model in multi-cultural higher e-Education context.

Keywords. Recorded audio feedback, RAF, academics, multi-cultural higher education, distance learning, e-Education, thematic networks analysis, Business Process Model and Notation, BPMN

1. Introduction

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 [1]. Providing feedback is an essential part of the teaching and learning process and can be utilized by learners to enhance their future academic performance [2, 3]. 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 [4, 5, 6].

The multicultural nature of higher education makes it critical that academics and instructional designers, especially those working in e-Education environments, are culturally aware when they deliver instruction, feedback and assessment to learners. Providing feedback to learners on their writing assignments is one of the most important

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and time-consuming tasks that an academic performs. Formative feedback concerns development, improvement, and learning, whereas summative feedback concerns accountability and performance [4]. Summative feedback evaluates a person's learning at the end of an instructional unit by comparing it against some standard or benchmark.

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, an academic 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. RAF can be defined as formative and/or summative messages that are recorded and distributed by academics as digital audio files to individual learners or learner groups in response to both on-going and submitted work [1].

The aim of our study is to shed light on how academics experience using RAF as a feedback method in multi-cultural higher e-Education context. The objective is to identify academics' perspectives to RAF by thematic analysis of the research data, which might reveal challenges and indicate good RAF practices for e-Education, especially in information and communication technology (ICT) discipline. Based on our analysis we introduce a preliminary RAF process model in multi-cultural higher e-Education context. Our model is based on Business Process Model and Notation (BPMN) [7].

Throughout this paper, the term 'learner' refers to the person receiving the feedback, while the term 'academic' refers to the individual giving the feedback. We begin by summarizing RAF research and cultural dimensions in higher education context as our theoretical framework in Section 2. Our study context and research method are introduced in Sections 3 and 4 respectively. Preliminary findings and our model is presented in Section 5. We conclude and discuss our future work in Section 6.

2. Theoretical Framework

2.1. RAF Research

Several studies on feedback show the importance of the timeliness of the feedback [8-13]. Learners highlighted the impact of feedback timeliness on future performance. Further, the clarity of written comments was considered to be an important factor among learners. In practice, written comments on assignments are often unclear, difficult to read and confusing to learners. In many cases, written comments contain academic jargon that is unfamiliar or unclear to the learner. From the learner's viewpoint, good-quality feedback contains detailed information on how to improve, is applicable to future work, is personal and is timely [14]. RAF can help learners to overcome the issue of clarity.

Learners may benefit more from RAF because listening to the voice of the academic is more appealing than just reading his or her comments, being able to hear the comments while reading the document is more personal and the feedback itself is clearer. Although several studies have been carried out on RAF, they were mostly conducted in class courses, in which it is not clear if revised versions of the learners' assignments were involved. Further, most studies were done in face-to-face class contexts, in which face-to-face dialogue with the academic can help to clarify RAF comments [2, 13, 15-18].

Studies which have focused on RAF in higher e-Education environments [19-23] reported that RAF could reduce learners' feel of isolation and lack of personal connections, which can be features of studying in an e-Education mode. The studies of

effectiveness of academics' RAF have concluded that learners utilized RAF in different and more meaningful ways than they did written feedback learning [17, 18]. It has also been noted that RAF bridges a gap between the learner and the academic and is a time-saver for the academic [1, 18, 19].

Previous studies [2, 8-23] have found that most learners have an overall positive attitude towards RAF. The underlying reasons for this attitude can be summarized as follows: (a) academics can say a lot more in five minutes than they can write in the same amount of time, (b) audio feedback means clearer feedback; more detail means less ambiguity, and speech can communicate meaning beyond the words, (c) vocal emphasis and variations of pace can focus attention on the most important or complicated aspects and (d) audio feedback feels more personal than written feedback, especially in the case of distance learning.

However, many of the studies have been carried out from learners' point of view. To complement RAF research, we have first studied how academics experience use of RAF as a feedback method in Finnish-speaking higher e-Education environment [24]. The benefits reported concerned more versatile communication measures and reduction in cognitive and physical load. Overall attitude of the participants towards RAF was positive. Participants also reported unpleasant feelings from sensitivity of using human voice, sitting alone in workrooms. Altogether, the participants said they will continue using RAF. Three of them reported that they intent to use RAF only or a combination of detailed RAF and written summarizations. One participant, who noticed difficulties in applying RAF to programming related feedback, will continue testing RAF in non-exact task settings. The participants highlighted that RAF is more suitable for writing type learning tasks than exact exercises. All participants asked their students to communicate back about RAF. Their learners had sent positive feedback.

In this paper, we extend our contribution to RAF research by focusing on academics' perspectives on RAF in a *multi-cultural* higher e-Education setting.

2.2. Cultural Dimensions in Higher e-Education Context

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 [25]. Parrish and Linder-Van Berschot study cultural differences to recognize those dimensions of culture that are most likely to impact educational situations [26]. These dimensions integrate the three main cultural models: Hall's model [27], Hofstede's model [28], and Lewis' model [29] (the cultural models are only referred here because they have been discussed in more detail in several EJC-forum papers, such as [30-34]. 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.

An extension of Parrish and Linder-Van Berschot study to multi-cultural e-Education context has been discussed in [32]. Here we consider the cultural dimensions from RAF perspective (Table 1).

Table 1. The cultural dimensions of an e-Education framework from RAF perspective.

Social relationships	**How this dimension might manifest in RAF context?**	
Equality and authority How is inequality handled? How is status demonstrated and respect given? What interactions are appropriate for those of unequal status?	**More equality** Academics are treated more as supervisors. Learners take responsibility for learning activities. Dialogue, discussions and RAFs are critical learning activities.	**More authority** Academics are treated as authorities; they are responsible for what happens in the e-course. Academics are primary communicators and RAFs are taken as "must-to-do-lists".
Individualism and collectivism Which prevails: the interest of the individual or the interest of the group?	**More individualistic** Learners are active. Cognitive skills are primary. Expression of the learner's point of view is a valuable component of learning and a dialogic RAF.	**More collectivist** Learners are quite passive; learning how to do is primary. Learners expect to accommodate academic's RAF.
Nurture and challenge Which is the more important: set of goals, cooperation and security or recognition and advancement?	**More nurturing** The average is used as the norm. All learners are praised. Collaboration is cultivated. Failure is a growth opportunity. There is more modesty.	**More challenging** The best learner is used as the norm. Only excellence is praised. Competition is cultivated. Failure is a highly discouraged.
Communication Low-context and high-context	**Low-context communication** In a low-context communication, information is explicitly stated in RAF.	**High-context communication** In a high-context communication, information is implicitly stated in RAF.
Epistemological beliefs	**How this dimension might manifest in RAF context?**	
Stability-seeking and uncertainty acceptance How is uncertainty dealt with (avoided/accepted What is the status of knowledge: established or in a process of development?	**More stability-seeking** Learning activities are structured and focusing on getting the right answers. Ambiguity is to be avoided. Academics are expected to tell exact corrections in RAF.	**More uncertainty acceptance** Learning activities are more discussions and projects. Ambiguity is a natural condition. Academic are expected to highlight various aspects in RAF.
Logic argumentation and rationality Which is more important: logical consistency or practical outcomes?	**More logical** There is a focus on logical argumentation to find truth. Debates/argumentations are learning activities. Being right is the most important. RAF is considered as a one-way from an academic to a learner.	**More reasonable** 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. RAF is considered as a dialogue between an academic and a learner.
Causality and situations How causality is assigned: is it a single, most likely source, or is it assigned to the broader context?	**More focus on causality (analysis)** Learners are expected to be goal-oriented. Knowledge is tied to cause and effect explanations.	**More focus on situations (holism)** Learners are expected to work within situational constraints. Knowledge is tied to explanations of situations.
Temporal perceptions	**How this dimension might manifest in RAF context?**	
Clock time and event time	**More clock focus**	**More event focus**

Which are more important for learners: deadlines or relationships?	Learning activities start and stop promptly. RAF is expected to come promptly after assignment submissions.	Learning activities may continue as long as they are useful. RAF is expected for example within in one week after assignment submissions.
Linear time and cyclical time Do learners see time during their e-course as a straight path or as an iterative and interlocking cycles/phases?	**More linear time** Learning proceeds along a linear path with clear prerequisites and milestones. RAF is seen as a to-do-list.	**More cyclical time** Learning is seen as an iterative, step-by-step process. RAF is seen to support phase-based learning.

The multicultural nature of higher education environments is an emerging trend. 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 [35]. This is a challenge because culture not only affects how we behave and think but also how we learn [35, 36**].** 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. Could RAF be a solution?

3. Study Context

Using a semi structured questionnaire approach (Table 2), the experiences of three case academics (participants P1, P2 and P3) were collected, transcribed, and analyzed. All participants were academics in the ICT education with over ten years teaching and supervising experience. Pedagogical models used by the case academics working on e-Education environments were problem based learning (PBL) [37] and progressive inquiry [38]. Common to these models are: (a) they are suitable and often used in e-Education and (b) academics adopt the role as facilitators of learning, guiding the learning process and promoting an environment of inquiry for attempting to get learners to apply knowledge to new situations.

Participant P1 and P2 were experienced users of RAF and P3 was a novice with RAF. The participants used RAF in advanced level international e-courses titled Requirements Engineering (P1), Software Engineering Management (P2) and Time Series Analysis (P3) for commenting writing assignments such as learning diaries, individual exercises, group work reports and exact mathematical exercises. Foreign learners were from France, Germany, Italy, India, China, Japan and Thailand. Foreign learners account for 45 % of all learners. All participants were teaching and supervising in English (Finnish is their native language). The study was carried out during the spring and autumn terms in 2018.

Technical preparedness and skills related to RAF and e-Education environments were very good among the participants. Audacity, a free, open source, cross-platform audio software for audio recording, and Moodle, a free and open source e-Education environment, were used for RAF creation and delivery by all participants. The lengths of the RAFs were most often 5-10 minutes.

Table 2. Semi-structured interviews for academics.

Language • Was the course language only English or English and Finnish? • Did your course include learners who speak English as their native language? • How did you feel using English language in RAF for your international learners? • Which language did you use in RAF for your Finnish learners? • Please, list the nationalities of your learners and how many each?
Speaking style • Did you speak same way or differently to international learners and Finnish learners? Did you notice yourself any difference in your speaking style? • If you noticed differences in your speaking style, please describe the differences?
Culture • Did you speak differently to different nationalities for example according to the country/culture? Did you notice yourself any difference in your speaking style? • If you noticed differences in your speaking style, please describe how did you take different cultures into consideration? • Did you get any feedback from your learners about RAF? • If yes, please describe the topics that the feedback involved and which was/were the nationality(s) of the giver(s).
Tone of voice • Did you use different tones of voice in RAF (for example glowing, supportive, critical, and eloquent) independently from learner's nationality? • Did you use different tones of voice in RAF for international learners and for Finnish learners? • Did you use different tones of voice in RAF according to cultures? • How did you express in RAF faults and issues to be fixed in your learners' assignments? • If you were enthusiastic of your learner's assignment - it was very good/innovative - did you notice if your tone of voice was different in RAF?
Free topics • Please, feel free to add other comments related culture and RAF. • Please, feel free to add other comments related to tone of voice in RAF. • Please, feel free to add other comments related to RAF research topics.

4. Thematic Network Analysis

Qualitative research is any that does not involve numbers or numerical data. It often involves words or language, but may also use pictures or photographs and observations. Qualitative research is characterized by its objectives, which relate to understanding some aspect(s) of the phenomena concerned. Thematic analysis aims to identify the essential topics or themes forming the data [39]. Themes are as topics, which recur in data in one form or another. Thematic analysis proceeds from identifying and categorizing the themes to enable you to carry out a closer and more detailed exploration. Thematic network analysis is a tool for qualitative research.

Thematic network analysis is a step-by-step method for analyzing and synthesizing qualitative data. It collects textual data and organizes the information into a network diagram. Textual data is broken down into manageable clusters of patterns and themes. It explores the relationships between topics from a micro to a macro perspective. Thematic network analysis has three classes of themes (Figure 1) [39]:

- *Basic Themes* are simple premises, lowest-order themes, of the collected data. Basic Themes say very little on their own. As they are clustered together they start complimenting each other and form organizing themes.

- *Organizing Themes* as middle-order themes, assemble basic themes into similar clusters forming an argument or position about the situation. They both group the main ideas proposed by several Basic Themes, and dissect the main assumptions underlying a broader theme that is especially significant in the texts as a whole. In this way, a group of Organizing Themes constitutes a Global Theme.
- *Global Themes* filter organizing themes into one insight that summarizes the comprehensive issue. They are super-ordinate themes that summarize and make sense of clusters of lower-order themes abstracted from and supported by the data. Thus, Global Themes tell us what the texts as a whole are about within the context of a given analysis.

Advantages of TNA are (a) exploration of multiple relationships between the understanding of an issue, (b) analysis of complex data and (c) themes are emerging from data. Disadvantages of TNA are (a) strong dependence on data collected in other methods, (b) a global theme may rule out nuanced data and (c) clustering the data depends on the researcher's interpretation.

The thematic network analysis approach also encourages discussing possible connections and/or tensions inside and between the networks, which is illustrated by dash line in Figure 1.

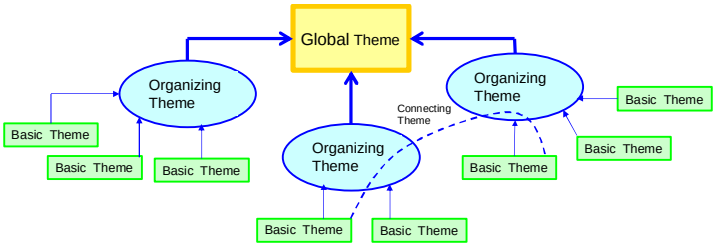

Figure 1. A basic structure of a thematic network [39].

The analysis process in our study proceeded as follows. The participants were told that they can record or write down their answers to the semi structured questionnaire. The data received were transcribed. The first author filtered out 75 samples from the transcribed data and derived 48 basic themes from these samples. The same person grouped the basic themes into similar clusters forming six organizational themes, and finally summarized organizational themes in the form of two global themes. Thus, the analysis produced two thematic networks. Validation of the process was carried out by randomly separating 25 samples of the 75 samples corresponding 33 % of the whole data. The cross-checking was carried out by the colleague of the first author of the paper, who was not a participant of the case study itself and is an expert in applying thematic network analysis and knows RAF very well. As a result, one basic theme was added and three basic themes could belong into two organizational clusters depending on the viewpoint. The process altogether included iterative reviews of the data, and, resulting from discussions, two organizational themes were renamed. The paper was reviewed by the two last authors who were study participants. They regarded the themes as illustrative, indicating internal validity.

5. Findings

The thematic network analysis of our study produced two global, six organizing and 48 basic themes. Themes are indicated in *italics* in the text. First we introduce the two global themes which are named "Speaking style" and "Culture neutrality/sensitivity". Speaking style refers to communication aspects of RAF reported by the participants. Culture neutrality/sensitivity concerns behavioral and language topics in RAF context reported by the participants. Finally we illustrate the themes and RAF process by means of BPMN.

5.1. Speaking Style

A thematic network titled *Speaking style* is illustrated in Figure 2. The network shows the different organizational and basic themes of speaking style in RAF context.

All participants reported experiences of *tone of voice*. They felt that they could use their tone of voice to add *more semantics* (*supportive, expressive, excitable, critical, glowing, and personal*) to RAF. However, only the participant P3 reported to have used it whereas others kept their voice *neutral, polite* or *monotonous.* All participants discussed that more eloquent way of speaking would be interesting experience. However participants also feared losing their own identity and that they would overact. They also agreed that British and American communication styles are more expressive than Finnish style.

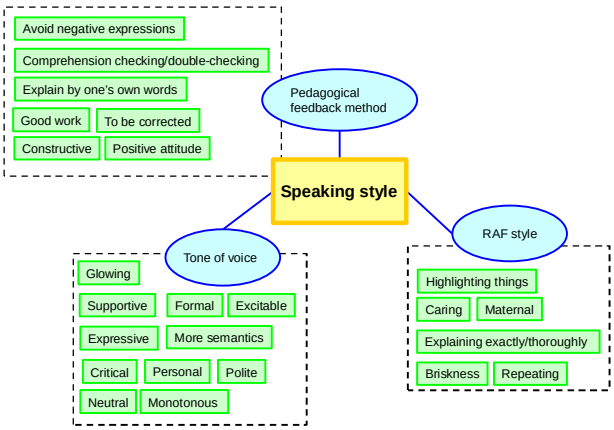

Figure 2. Thematic network for global theme "Speaking style".

All participants highlighted similar issues in multi-cultural RAF style. They think that it is very important to *explain exactly and thoroughly* the essential feedback topics in RAF. Participants also experienced that repeating and highlighting things were necessary for making better comprehension among learners. Participant P3 reported using *caring* and *maternal* approach especially with Asian learners and briskness with learners from Southern Europe.

Pedagogical feedback methods were similar among the participants. They avoid *negative expressions* in RAF. *Good work* and issues *to be corrected* were expressed in *constructive* way. Participant P3 highlighted that *comprehension checking/double-*

checking is very important and can be done for example by asking a learner to *explain by his/her own words* the topic under consideration.

To summarize speaking style, all case academics realized the potential of using more expressive tone of voice. They preferred to stay rather neutral, only now and then they showed stronger expressions. Finnish communication style, which is usually rather objective, might be a reason this kind of behavior. However, case academics showed for example caring more with actions (explaining thing thoroughly, highlighting topics etc.) than with colorful tone of voice. Pedagogically speaking all academics supported positive and constructive approach in RAF.

5.2. Culture Neutrality/Sensitivity

The second global theme related to *culture neutrality/sensitivity*, in other words how case academics experienced cultural dimensions (Table 1) in RAF context. The thematic network is shown in Figure 3. The network illustrates the different organizational and basic themes related to culture neutrality/sensitivity.

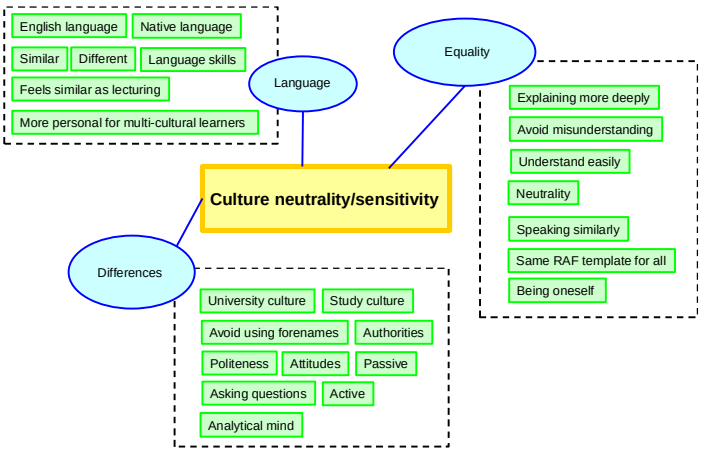

Figure 3. Thematic network for global theme "Culture sensitivity/neutrality".

Language belongs to social relationships category in Table 1. *Language* issues caused various reactions among the participants. Participant P1 used *English language* for all learners, participants P2 and P3 used English language for foreign learners and *native language* (in this case Finnish) for Finnish learners. All participants were used to teach in English. However, they felt that *language skills* might have an effect on their RAF content and style. Participants P1 and P2 felt their RAFs were *different* in English than in Finnish. Participant P3 reported that RAFs felt *similar* without language effect. Participant P1 experienced preparing English RAF in multi-cultural context *similar as lecturing*; speaking style was not as dialogic as for Finnish learners. However, P1 felt RAF creation *more personal for multi-cultural learners.*

Equality and *differences* are more or less related to epistemological beliefs and temporal perceptions categories in Table 1. All participants reported on the one hand *equality* experiences in RAF and on the other hand *differences*. Participant P1 kept

neutrality in creating RAF. P1 reported *speaking similarly* to all learners and using the *same RAF template for all*. P1 also highlighted that it is important to *be oneself* although some cultural differences among P1's learners occurred. Participants P2 and P3 said that they tried to *avoid misunderstanding* among multi-cultural learners by *explaining more deeply* in RAF, although some learners *understood* RAF *easily*.

According to all participants also cultural *differences* occurred. They felt that *university culture* and *study culture* had an effect on learners' *attitudes* towards *authorities* (supervisors). For example, some learners were *passive*, not asking questions. They *avoided using* their supervisor's *forename* and their behaved very *politely* when commenting their RAFs. Some learners were very *active* and showed *analytical mind* by *asking questions* related to their RAFs.

To summarize the effect of culture in RAF context, we can conclude that generally speaking all case academics supported neutral approach. Contextually they took into account culture-sensitivity and adjusted their own RAF behavior to ensure learners' success and progress.

5.3. RAF Process Model

A standard Business Process Model and Notation (BPMN) will provide businesses with the capability of understanding their internal business procedures in a graphical notation and will give organizations the ability to communicate these procedures in a standard manner [7]. The graphical notation will facilitate the understanding of the performance collaborations and business transactions between the organizations. In our case "business" is e-Education, "performance collaborations" are interactions between academics, learners and an e-Education environment, and "business transactions" are e-course actions according to academics' pedagogical model. We apply BPMN to illustrate the findings derived from our study data (by means of the thematic network analysis) and the RAF process as a whole (Figure 4). The topics in Figure 4 are indicated in *italics* in the text

We identified three processes and one resource, which we titled as *academic's technical process*, *academic's pedagogical process*, *learner's process* and *e-Education environment*, respectively. Our focus is on the academic's technical process related to RAF. First, the academic chooses the *type of assessment* which in our case study is formative. Preparing the RAF is affected by academic's *target-orientation*, *professional skills and* choice *of pedagogical model*. Target-orientation is determined by course learning objectives, syllabus and/or curriculum. Professional skills can be attributed as learner-centered, expert in his/her own field, interpersonal and cultural awareness. There are several different pedagogical models, which the academic can choose. In our case study academics applied problem based learning (PBL) [37] and progressive inquiry [38].

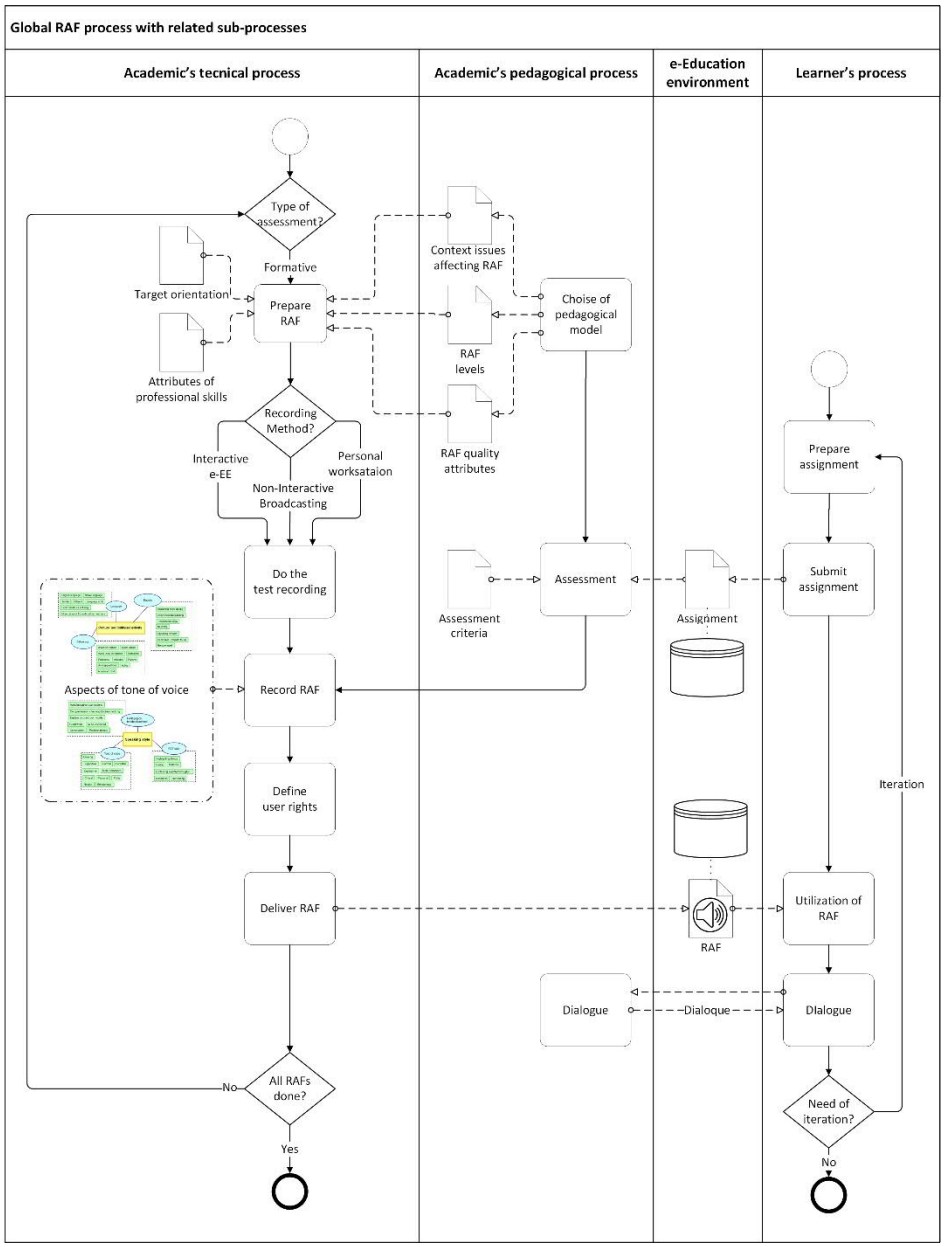

Figure 4. A preliminary RAF model in multi-cultural higher e-Education context based on our case study.

Examples of *context issues affecting RAF* are timing of the feedback, amount of time used, tone of voice, individual or group format, and nature of assignment. The academic's RAF can have several depth *levels* such a global-level, middle-level, micro-level and meta-level [20]. Examples of *RAF quality attributes are* academic's precise attention to the specific issues, relevant to practice, stating clear aims, possible and

attainable, allowing adequate time to achieve the total outcome, encouraging, constructive and descriptive.

There are several RAF *recording methods*, which the academic can choose: digital recording in an *interactive e-Education* environment, non-interactive broadcasting (audio publishing platform for one-way broadcast for multiple viewers) and personal workstation (recording, for example, with Audacity, saving as .mp3 and delivering via an e-Education environment or email). It is recommended first to do a *test recording* and then *record RAF*. After recording RAF, the academic *defines the user rights*, in other words right RAFs to right learners or learner groups. After *delivering RAF*, the academic will start a new recording as long as all RAFs are done.

Learner's process starts with *preparing the assignment* and *submitting the assignment* to an e-Education environment. Before recording the RAF the academic assesses the assignment according the chosen pedagogical model and *assessment criteria*. The learner should be active in *utilization of RAF*, and the follow-up can be assignment iteration. In addition, the academic and the learner can have a *dialogue* about the RAF.

6. Conclusions

Our study reported academics' experiences of using RAF as a feedback method in multi-cultural higher e-Education context. The objective was to identify academics' perspectives to RAF by thematic analysis of the research data, which might reveal challenges and indicate good RAF practices for e-Education in information and communication technology (ICT) discipline. Based on our analysis we introduced a preliminary RAF process model, which can be applied to and used in other academic disciplines as well. We identified two global themes: speaking style and culture neutrality/sensitivity.

To summarize speaking style, all case academics realized the potential of using more expressive tone of voice. However, they liked to stay rather neutral, only now and then they showed stronger expressions. Case academics preferred to show caring more with pedagogical course of actions than with colorful tone of voice. Pedagogically speaking all academics supported positive and constructive approach in RAF. At first, the second global topic culture neutrality/sensitivity may sound contradictory; however both dimensions are supporting each other in RAF context. Neutrality in RAF treats all learners equally and sensitivity in RAF promotes learning and progress considering learners' diversity.

In light of our case academics study, supervisors' tone of voice in RAF manifests itself more as pedagogical actions than as an eloquent way of speaking. This observation leads us to analyze deeper the concept of "tone of voice" in RAF context. In addition, the observation shows us how interestingly both thematic networks of our study are actually connected to each other. We titled the connecting theme as "aspects of tone of voice" (Figure 5) and it will be our interest for further RAF research.

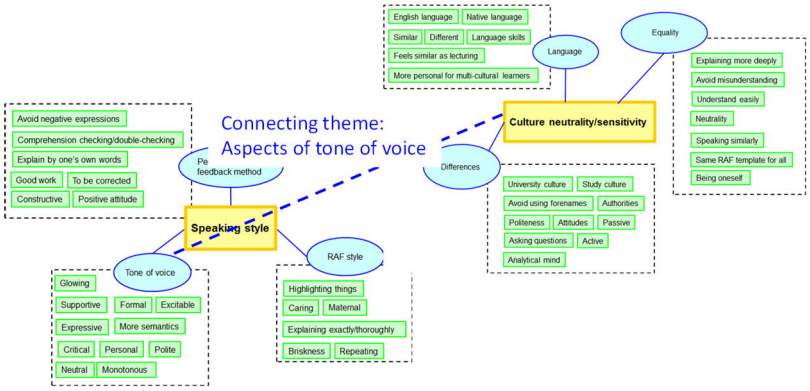

Figure 5. Connecting theme: Aspects of tone of voice.

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