Multimedia Artefacts and Teaching-Learning Experiences Relating to Summative Assessment Feedback (SAF) and Student Overall Satisfaction

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This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

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0. ABSTRACT

This exploratory intervention study presents a broad mapping of nursing students' and lecturers' opinions of different mediating multimedia artefacts (MMAs: online-written, audio and video), before and after the new artefacts introduction (intervention), about their teaching-learning experiences through Summative Assessment Feedback (SAF) effectiveness, efficiency, and transformation motives for their satisfaction. The study applied a mixed method of quasi-experimental design with an intervention, evaluated via an institution-wide student survey, followed by interviews with students and lecturers. Before the interventions, students' unfamiliarity with audio and video artefacts in SAF leads them to prefer online-written artefact in the School. Statistical analysis of goals (variables) show that while easy access, usefulness, professionalism, mobile learning, clarity, and personalisation were the most popular for the use of online-written artefact in SAF respectively; the goals of "faster to learn, easier to remember, paying more attention and providing more information" were more popular for the video artefact. The audio artefact consistently ranked the lowest choice amongst students. Additionally, there were statistically significant differences for video artefact potential to improve student satisfaction in SAF amongst all goals. Following the MMAs' actual use in summative OSCE assessment feedback, the students express their preference for the video artefact over online-

written and audio. Lecturers suggest "seeing is believing" in OSCE assessment feedback. Therefore, visually salient online-written and video artefacts are perceived as more beneficial than audio for their students. Yet, as they propose SAF in essay types require "seeing in detail is believing", they argue for contextualisation of different assessment types. Furthermore, video artefact in OSCE feedback provides better guidance, motivation, and important points with wider summaries, whereas online-written artefact facilitates detailed error corrections, standardisation, and justifying grades through linking rubrics. Nonetheless, these choices are affected by assessment rules, division of labour and software design elements, according to the CHAT-informed interviews with lecturers.

CONTENTS

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LIST of ABBREVIATIONS

CHAT	Cultural and Historical Activity Theory
DBR	Design-Based Research
DoL	Division of Labour
EFL	English as First Language
ESOL	English for Speakers of Other Languages
HE	Higher Education
MMAs	Mediating Multimedia Artefacts
OSCE	Objective Structured Clinical Examinations
OSO	Overall Satisfaction Outcome
SAF	Summative Assessment Feedback
TEL	Technology-Enhanced Learning

LIST of TABLES

1. INTRODUCTION

1.1. Research Purpose and Audience

Online Summative Assessment Feedback (SAF) and the use of different mediating multimedia artefacts (MMAs) have been increasingly explored to provide digital feedback for Higher Education (HE) students in recent years (Broadbent et al., 2018; Zimbardi et al., 2017; Phillips et al., 2016; West and Turner, 2016; McCarthy, 2015; Harrison et al., 2015; Reed et al., 2015; Voelkel and Mello, 2014; Watkins et al., 2014; Cann, 2014; Crook et al., 2012; Hepplestone et al., 2011; Gikandi et al., 2011). SAF activity is a multifaceted and complex process that lends itself to multiple understandings of teaching-learning experiences and satisfaction outcome in HE (Dunworth and Sanchez, 2016). The findings about the use of different MMAs (i.e. online-written, audio, and video) in SAF are often contradictory, limited and offer different elements on student learning experiences (refer to Section 2.1.3: Review of Data Findings). In general, there is a scarcity of research to map both students' and lecturers' opinions and experiences relating to a variety of MMAs to support SAF activity.

This thesis is a sequential and exploratory intervention case study that addresses the stated gap above by providing a breadth of understanding from students' and lecturers' own experiences, as

linked to various MMAs for SAF in the context of School of Nursing and Midwifery in a Scotland higher education institute.

The overarching research question is:

"What are nursing students' and lecturers' opinions *of different MMAs (i.e. online-written, audio and video) before and after the new artefacts introduction (intervention) in relation to their teaching-learning experiences through Summative Assessment Feedback (SAF) effectiveness, efficiency, transformation motives and student overall satisfaction?"*.

I aim to answer this leading question and its related sub-questions by applying an adapted mini Design-Based Research (DBR) approach to evaluate different MMAs interventions, with its overall approach with mixed methods (surveys and interviews). Through its mixed-method design, the study focuses on teachers and students experiences of SAF with various MMAs designs, and tests design interventions with those different MMAs in an educational context in the School.

Themes in data analysis focus on eleven goals as variables influencing nursing student experiences through students' overall satisfaction outcome (OSO) that is a positive teaching-learning outcome relating to these features. These eleven goals are contained within various aspects of effectiveness, efficiency and transformation motives of educational achievement in the School.

Building on the work of Crawford and Hasan (2006), effectiveness, efficiency and transformation motives are used to measure changing student experiences of learning and their OSO. The authors describe the purpose of (SAF) activities with Activity-Action-Operation and Motive-Goal-Outcome relationship to be interconnected for the use of MMAs in relation to their teaching-learning experiences. Subsequently, these three motives generate SAF with various MMAs and determine eleven goals (variables) in this study. These eleven goals result in students taking different actions for the use of each MMA in SAF to increase their OSO. These eleven goals under each motive are:

- **Effectiveness:** familiarity, usefulness, faster to learn, easier to remember information, paying more attention, and clarity
- **Efficiency:** ease of access and providing more information
- **Transformation:** mobile learning, personalisation, and professionalism

These goals through their asynchronous nature of communication can mediate multiple modes of interactions by means of online-written (i.e. web-links, inline-comments, standardisation, consistency), audio (i.e. auditory descriptions) and video (i.e. description with sound, body language, and visual demonstrations) over traditional paper-based SAF.

Although this study is focusing on SAF activity with asynchronous MMAs provided by lecturers to individual students, other synchronous Technology-Enhanced Learning (TEL) tools (e.g. Skype™ and Blackboard Collaborate™) also provide SAF with multimedia in wider HE and TEL contexts. To define its boundaries in this study, the SAF operation is defined as lecturer-led discussion between lecturer and individual student with asynchronous MMAs (i.e. online-written, audio and video).

Its intervention in post-intervention test conditions is restricted to its actual use of MMAs simultaneously in Objective Structured Clinical Examination (OSCE) assessment feedback context.

Descriptions and terminologies used in SAF with MMAs can vary considerably in the TEL literature and across different contexts. Most studies in TEL are small scale, single subject, and opportunistic through good-practice examples. In fact, aligning with Evans's (2013) findings, there are only a few empirical publications on SAF with audio and video artefacts to discuss this topic effectively because their type of scientific methods, smaller sample size, lack of data sets, the effect population, and different modes of study (i.e. blended and e-learning) are often impossible to identify. Reasons for a lack of broader scope empirical studies in TEL research is apparent in Kirkwood and Price's (2014, p.3) literature review stating that most studies in the literature share a "short story of

good practices" to avoid the "unnecessary duplication of efforts and expenses" in HE institutions. Despite recognising that most TEL projects are relatively small-scale pilot studies and context dependent to a particular HE institute, Kirkwood and Price (2014) implied a collection of 'lessons-learned' from similar interventions to provide necessary evidences of benefits. However, in my view, such a common trend in TEL developments generally indicates a risk of misinterpretations through ignoring cultural-historical developments of online SAF with MMAs and context dependence in HE. Henceforth, I aim to conduct two integrative literature reviews in the study to:

- Extend my earlier findings from the systemic literature review and combine it with grey literature findings to effectively discuss the topic.
- Identify teaching-learning experiences in SAF with MMAs, changing student experiences and OSO, its motives and goal categories.

Overall, this thesis contributes to the knowledge in the broader area of technology-enhanced learning (TEL) and more specifically, the area of using MMAs for SAF in relation to key users' opinions and experiences.

1.2. Exploring SAF and MMAs in a Nursing Education Context

SAF fostering "assessment of learning" is crucial in nursing education in a teaching-learning context. SAF aims to help nursing students understand their strengths and weaknesses in order to support independent learning processes as an essential part of continuing their school life, students' practice placement periods, and life-long learning activities at work in healthcare services (Taras, 2002). However, as judgement of a graded assessment, SAF activity is not always utilised successfully in HE (Harrison et al., 2014; Boud and Falchikov, 2007). With the recently improved availability of different MMAs, these tools have become popular teaching-learning practices within generic topic materials in the VLEs. Nevertheless, the use of different MMAs in generic (group) topic materials has significant educational differences over a personal (individualised) SAF context in terms of their academic standards, motives and goals. Hence, it becomes necessary to reconsider what needs to be done for the use of different MMAs in relation to online SAF effectiveness, efficiency, transformation motives to improve student OSO. When rethinking teaching-learning experiences, there is a scarcity of research to map both students' and lecturers' opinions and experiences for the use of different MMAs to support SAF.

Summative OSCE assessments (OSCE) are currently used in all health care (i.e. nursing, medical, and pharmacy) and social care education in the UK. In the context of nursing education, OSCE is intended to test nursing students' clinical skills such as communication skills and their ability to deal with patient behaviour successfully by differing from other essay (written) style assignments in their design processes. During the assessments, each undergraduate and postgraduate student is observed and examined on an individual basis by lecturer(s) in different clinical settings with volunteering patients in the School Clinical Centre. Currently, there is no research study for these different MMAs in OSCE feedback for nursing education in the UK. Although there is only one study done by Harrison et al. (2015) in a medical science school for the use of online-written text and audio artefacts in OSCE feedback, their study still excludes video artefacts in an OSCE feedback context. Therefore, the findings about OSCE feedback with three main different MMAs are relevant to all health and social care education sector in the UK.

As a social-action adopted from a CHAT theoretical perspective, this study will examine the nursing students' learning experiences to interact with the established SAF Rules, Division of Labour (DoL), and norms within the School Community through their multi-voicedness and historicity.

With its sequential and exploratory intervention case study method, this study is equally aimed to close the gap in the literature by providing breadth of understanding about lecturers' and students' experiences through motive and goal variables from both undergraduate and postgraduate nursing students' perspectives. This is achieved by focusing on the pertinent key themes as:

- Link between teaching-learning experiences and (dis)satisfaction in SAF
- Role of different MMAs in SAF
- Understanding nursing students' opinions of different MMAs, before and after the new artefacts intervention, in relation to their learning experiences in OSCE summative feedback in the School
- Operation of motives and goals for three different MMAs types in SAF
- Difficulties and strengths occurring in OSCE feedback with three MMAs from lecturers' perspectives

1.2.1 Student and Lecturer (Dis)satisfaction with SAF

There seem to be tensions between learning experiences of students and teaching experiences of lecturers in SAF activity in the UK. To illustrate this, many students across universities have jointly reported their dissatisfaction with their assessments and feedback activities in recent national student surveys (NSS) (Mulliner and

Tucker, 2015; Westwater-Wood and Moore 2016). To add to this, in 2017 NSS results, around a quarter of UK students (27%) are still not satisfied with the clarity and promptness of their feedback; this gap is even larger in Scotland than the rest of the UK (HEFCE[2], 2017). On the other hand, from lecturers' perspective, there are large amounts of crucial assessment feedback provided to students in SAF (Pitt and Norton, 2016). However, they are equally concerned with their students' inadequate engagement, unawareness, and lack of proactive responsiveness (West and Turner, 2016; Westwater-Wood and Moore, 2016). Further, students' own perception of its timeliness, misinterpretations about its usefulness and quantity goals in SAF are also affecting their OSO (Crook et al., 2012). On the contrary, these findings do not align with Doan's (2013) conclusions that students (n=206) are very receptive to their lecturers' feedback and act on all assessment feedback processes in the UK. Yet, despite limited attempts to improve SAF with MMAs, their impacts are still negligible in the current literature (Pitt and Norton, 2016; West and Turner, 2016; Mulliner and Tucker, 2015). Henceforth, it can be concluded that HE institutions are uncertain as to which MMAs in SAF are useful for changing student experiences.

Two different multimedia actions of SAF delivery are synchronous and asynchronous modes. In my view, synchronous tools are methodically different MMAs by providing two-way communication in

real-time. Thus, their design differences in communication methods can affect the nature of engagement, dialogues, content, structure, speed, timing, quantity, quality, and format of feedback provided. Hence, it is necessary to mention that I aim to focus on only the use of asynchronous MMAs in SAF activity in this study.

Furthermore, similar to any teaching-learning activities in TEL context, SAF activity with MMAs can change students' learning experiences to allow the feedback to become easily accessible, cost effective, immediate online availability, and efficient by monitoring its usage through online learning analytics tools. However, monitoring the use of MMAs in SAF through learning analytics is still in its early stages to produce consistent meaningful results. For example, in the School, the current SAF system (Feedback Studio™) can only record up to 30 seconds of student access into SAF of online-written artefact. Besides, any further student activities (i.e. length, time, visited links, or any downloads) cannot be recorded. In my view, such learning analytics are equally useful in understanding teaching-learning experiences relating to their expectations, needs, and intentions. Importantly, any distinctive MMA must be used purposefully and creatively for any enhancements in teaching-learning activities (Bates, 2008). This also relates to SAF activity with MMAs. Similarly, cost to produce, adequate staff time, study mode (face-to-face/e-learning), and lecturers' training needs are crucial for the use of MMAs (Richard, 2016; Cremonesi et al., 2017).

Otherwise, their use interferes with teaching-learning experiences in unintended ways (Ticona, 2015).

1.2.2 Multi-voicedness in School Community

During students' access into SAF with MMAs, the interactions tend to focus on individual students in their changing learning experiences and their OSO. However, as a social-action adopted from a CHAT theoretical perspective, this study will examine the nursing students opinions and experiences in the School to interact with the established SAF rules, DoL, and norms within the School community through their multi-voicedness (Engeström, 2001). For example, SAF with online-written artefacts action is currently mandatory in the School through its rules. Hence, some students might already be familiar with the use of online-written artefact in different SAF activities in the School. Additionally, they receive e-learning inductions for electronic management of assessment operations as a joint activity in each academic year. Rules for attending these sessions are mandatory and communicated to them through assessment policies. As DoL, the module/course teams have developed the guidelines and instructions for the use of online written artefacts in SAF. Besides, SAF rules have already been discussed and agreed with their students' representatives. Moreover, after receiving SAF in modules, all students are requested to evaluate their learning experiences via module specific surveys as an established rule. The results of their feedback are discussed

between student representatives and academic teams as a joint social activity, as these roles are developed by rules, DoL, and norms in the School community interactions.

1.2.3 Historicity of Nursing Students' Experiences of SAF

To understand the importance of social, historical and cultural practices for adoption of TEL solutions in nursing education, any wider contextual forces and power relations remaining hidden need to be acknowledged (Kelly, 2018). Differences in TEL developments between the School and University are equally reflected on SAF with MMA developments in nursing studies. These wider contextual forces and power relations are:

- School community opinions of TEL integration into nursing studies through its, norms, rules and DoL in the School
- University's own agenda to implement TEL tools in its VLE
- Political and financial plans from NHS-Scotland and the Scottish government spending
- Nursing and Midwifery Council (NMC) and public sector norms about nursing education in Scotland

Thus, SAF activities in the School community are influenced by not only the university's policies and academic regulations in HE but also the historical and cultural views of nursing professionals in the UK and the national government in Scotland. For example, all nursing courses in HE are regulated and validated by the NMC in the

UK. In addition, nursing funding and policies are regulated by the Scottish Government. Furthermore, during their undergraduate studies in the UK, all nursing students are required to spend half of their study periods (i.e. 2300 hours) on nursing practice placements. Correspondingly, new NMC education standards about students' assessment requirements (NMC[1], 2018) are blurring the boundaries on how nursing students should be assessed between theory and practice activities in HE. These standards (NMC[2], 2018) imply that cultural transformations amongst HE nursing education providers are closely linked with the societal developments in health and care norms in the UK because:

"Nursing and midwifery practice today is different from a decade ago and we know it will change even more in the next 10 years. As the health and care landscapes change, our NMC education standards need to evolve in education" (NMC[2], 2018).

1.2.4 Summary

The use of different MMAs can create new possibilities for delivery of effective, efficient, and transformational SAF and improves student OSO in HE. These discussions are surrounded by healthcare professionals' views and academic standards but often diversify in the way that SAF with MMAs are experienced through various motives and goals affecting students' OSO in the School. This is a function of the relationship between SAF and different MMAs,

teaching-learning experiences and student OSO, and motives and goal factors (variables). As a social-action, these opinions are often influenced by the students' previous SAF and different MMA experiences, differences between the University's institutional policies and the School's own localised SAF culture in its healthcare community, and relationship between student and lecturer relating to SAF with MMAs. In essence, such teaching-learning experiences interact with the established rules, DoL, and norms within the School community through its multi-voicedness and historicity. When reconsidering teaching-learning experiences in the literature, there is a scarcity of research to map both students' and lecturers' opinions and experiences for the use of different MMAs to support SAF. Besides, there are often contradictory findings for the use of different MMAs in a SAF context. Hence, it becomes necessary to reconsider what needs to be done for the use of different MMAs in relation to online SAF and the various motives and goals to consider a possibilities of how to improve student overall satisfaction in this study.

2. FOCUSED LITERATURE REVIEWS

This section includes integrative literature reviews on:

- SAF with MMAs
- Organisational Rules, Community and DoL
- Teaching-learning experiences relating to SAF with MMAs, student OSO, motives and goals

2.1. SAF with MMAs in HE: Integrative Literature Review

During my individual (unpublished) coursework in 2016/ED.S824 module at Lancaster University (LANC), I was interested to understand "what is known about SAF with different MMAs to change student learning experiences and student OSO in HE". That study helped me identify a gap in the literature which is the lack of understanding on varieties of MMAs in SAF and how students perceive these various types of assessment feedback in their teaching-learning experience and satisfaction. The findings also indicated existence of motives and goal variables for the use of MMAs in SAF activities.

I here aim to conduct a renewed integrative literature review by:

- including grey literature to effectively discuss the review question
- expanding its inclusion criteria to April 2018 (instead of October 2016, due to a sharp increase in publications) and
- word count limits being lessened in the thesis

Meanwhile, firstly, the systematic review had initially identified five different SAF multimedia formats:

1. annotated files with online-written text, i.e. Microsoft Word™ with "insert comment" or "track changes" functions
2. Interactive webpage with annotations for online-written, i.e. GradeMark™ in Moodle™ and Inline-Grading™ in Blackboard™
3. Audio-only
4. Video-only
5. Screen-casting (video format combining online-written, audio and video)

Then, these findings were grouped into three main MMA categories as online-written, audio and video artefacts in SAF because the publications relating annotated Microsoft Word™ and Adobe PDF™ formats were mostly prior to the 2010 period. Besides, exponentially growing popularity of new online management of assessment systems has already integrated this option into an 'online-written text' option. Furthermore, although alternative options such as supplementary text-plus-audio (Cann, 2014), and screen-casting (Mahoney et al., 2018; Marriott and Teoh, 2012) are proposed for utilising benefits of three main multimedia types in SAF, these supplementary approaches are still seen as audio or video artefacts, due to their technical production process. Therefore, categorising the findings into three distinct multimedia artefacts is

necessary to draw the boundaries between various multimedia artefacts though their technical production process.

Secondly, the systematic review reported a limited number of empirical sources because weighting on type of methods used in their analysis (i.e. non-response, over/under-represented), smaller sample and effect size, and context were not always possible to identify in some resources. In my view, this often indicates a widespread issue about TEL subject-specific research for its evaluations. Meanwhile, there are some grey literature sources available on university websites (SAF policy and procedures), publications from governmental agencies, and conference proceedings with certain relevance and potential contribution to TEL, SAF and multimedia. Hence, while standards in grey literature can vary considerably, they still have additional potentials to contextualise the phenomena of TEL with MMAs (Adams et al., 2017). However, their selection criteria and review processes are rigorous to avoid any misinterpretations for integrative review in the study.

Thirdly, defining keywords for literature review also highlight another widespread issue as a TEL subject-specific challenge. Evidently, different commercial/public organisations, research institutes, academic disciplines and professional interest groups contribute to TEL research with their varying cultural and historical

perspectives of SAF, ICT, multimedia and pedagogy by synonymous use of TEL terminologies rather than a joint approach (Alston, 2017), such as online feedback, digital feedback, e-feedback, electronic feedback, and computer-based feedback. Similarly, as podcast, recorded verbal, voice-only or sound files relate to audio feedback, the video feedback can be called veedback, vodcast, videocast, talking head, Panopto™ (software brand) or visual feedback in different subject-specific literatures. Furthermore, GradeMark™, the most popular online-written SAF tool, was rebranded in 2016 as Feedback Studio™ (Turnitin, 2017) showing another sign of continuously changing terminologies in TEL.

Next, although this study aims to compare the use of all three MMAs in the same SAF activity, the systematic review reports only a few empirical studies using a similar method.

Finally, any earlier literatures prior to 2010 often make a passing reference to the older ones. In my view, recent VLE software developments along with significant advances in audio/video tools (i.e. smartphones, improved multimedia server capacities in VLEs, HD portable webcams/voice-recorders) have made such articles and their choice of software/hardware tools become obsolete in the TEL context. Hence, the eligibility criterion is chosen between January 2010 and April 2018.

2.1.1. Literature Review Question

What is known about SAF with different MMAs to change learning experiences of student and OSOs in HE?

2.1.2. Methodology

A seven-step model (Higgins and Green, 2011), referring to Acta Paul. Enferm study, is used for:

- defining the research question
- locating studies
- critical evaluations
- data collection
- analysis
- interpretations
- refinements

2.1.2.1. Locating Studies

Data search tools used are:

- 'One-Search' tool in the online library at Lancaster University (LANC)
- Google Scholar

2.1.2.2. Critical Evaluation

For a new systematic review (white literatures in 'One-Search' tool at LANC), its eligibility criteria are:

- Journal publications from January 2010 to April 2018
- Articles in peer reviewed journals
- Conference proceedings
- HE education

In this study, grey literature includes of online resources, which cannot be found in LANC library, 'One-Search' tool. Grey literature only includes:

- Journal publications
- Conference proceedings with full articles
- Reports on university websites
- Policy documents
- Governmental agencies

Two-step selection criteria are employed in grey literature reviews for their selections:

1. Documents making no explicit references to other grey literature.
2. A seven criteria/questions criterion (Table 2.1), adopted from Garousi et al.'s study (2017, p.9), for evaluating grey literature to include them into an integrative literature review. In the criterion, all questions must be answered "yes" to be included.

Review questions (Garousi et al., 2017)	**Choice**
1. Is the intervention or outcome "complex" enough?	Yes/No
2. Is there a lack of volume, quality of evidence or consensus of outcome measurement?	Yes/No
3. Is the context important to the outcome or to implement the intervention?	Yes/No
4. Is it the goal validating scientific outcomes with practical experiences?	Yes/No
5. Is it the goal to challenge assumptions or falsify results from practice using academic research?	Yes/No
6. Would synthesis of evidence from the academic community be useful to communities?	Yes/No
7. Is there a large volume of practitioner sources indicating high practitioner interest?	Yes/No

Table 2.1: Seven criteria/questions criterion for grey literature

2.1.3.3. Review Search

Keywords:

Summative assessment, online feedback, audio, video, online written feedback, text, multimedia feedback, digital feedback, electronic feedback, e-assessment, eMarking, recorded verbal, vodcast, eFeedback, videocast, talking head, technology enhanced feedback, podcast, GradeMark, Inline-grading, and finally in combination of these keywords, (i.e. *"Summative assessment" and "feedback" or "online written feedback" or "audio" or "video" or "e-assessment*").

Trends in articles with keywords:

Within the LANC Online Library 'One-Search' tool on 24/April/2018, a keyword search between 2010 and 2018 under the 'everything' category (Table 2.2) demonstrates that there are more publications available about SAF with video ("Summative Assessment **Video** Feedback", n=2876) than with audio ("Summative Assessment **Audio** Feedback", n=1695). Meanwhile, "Summative Assessment **Online-written** Feedback" (n=5209) results are much higher than audio or video artefact literatures, indicating that HE institutions are still evaluating the SAF with audio or video artefacts, and yet these MMAs have not been mainstream SAF activities.

Keyword: "Summative assessment AUDIO feedback"		Keyword: "Summative assessment VIDEO feedback"	
Journals Name: Items	**Resource type:** Items	**Journals Name**: Items	**Resource type:** Items
Scopus-Elsevier:1,222	Articles:1,543	Scopus-Elsevier:2,052	Articles:2,596
Social Sciences Citation Index:566	Books:26	Social Sciences Citation Index:890	Audio Visual:1
OneFile-GALE:564	Newspaper Articles:7	OneFile-GALE:1,033	Books:43
ERIC:552	Conference Proceedings:101	ERIC:870	Government Documents:5
Taylor & Francis Online-Journals:467	Reference Entries:12	Taylor & Francis Online-Journals:713	Conference Proceedings:176
Science Citation Index:349	Reviews:2	MEDLINE/PubMed:677	Reviews:13
MEDLINE/PubMed:347		Science Citation Index Expand:661	Reference Entries:24
Science Direct -Elsevier:318		Science Direct ,-Elsevier:619	Newspaper Articles:15
ProQuest Business Collection:201		SAGE Journals:261	
SAGE Journals:149		ProQuest Business Collection:253	
ABI/INFORM Global:136		Springer Link:228	
Linguistics and Language Behaviour Abstracts:82		Linguistics and Language Behaviour Abstracts:96	
PMC-PubMed Central:91		Directory Open-Access Journals:123	
Springer Link:132		PMC-PubMed Central:144	
Directory Open-Access Journals:76		ABI/INFORM Global:170	
ACM/Digital Library:74	**AVAILABILITY**	ACM/Digital Library:136	**AVAILABILITY**
International Bibliography of Social Sciences:71	**Peer-reviewed Journals**:1497	International Bibliography of Social Sciences:73	**Peer-reviewed Journals:**2510
MLA International Bibliography:57	**Full Text Online:** 1695	MLA International Bibliography:64	**Full Text Online:** 2876
BMC Medical Education:55		Emerald Insight:37	
Assessment & Evaluation in HE:48		Springer Link Open-Access:53	
Emerald Insight:29		BMC Medical Education:60	
Springer Link Open-Access:28		Computers & Education:50	

Table 2.2: 'One-Search', keyword search between 2010 and 2018.

In addition, another keyword search under the 'everything' category on 24/April/2018 in the 'One-Search' tool (Table 2.3) shows that the number of 'Summative Assessment **Video** Feedback' (n=1710, 59% increase) and 'Summative Assessment **Audio** Feedback' (n=972, 57% increase) literatures have increased more in the last four years (January 2014 to April 2018) than the preceding four years (January 2010 until December 2013). This is evidenced that SAF with audio and video artefacts research is becoming increasingly popular in HE publications. However, despite growing in similar rates in publications in the last four years, the interests for SAF with video artefacts are much higher than audio.

'LANC One-Search', Full Text Online, (Period)	'Summative assessment **Audio** feedback', (Publication count)	'Summative assessment **Video** feedback', (Publication count)
from 2014 to 2018	972	1710
from 2010 to 2018	1695	2876

Table 2.3: Lancaster University, 'One-Search'

2.1.3.4. Data Analysis Review

Around 9,780 potential white literatures were found with the keywords. For audio artefact, there were 1,497 in peer-reviewed journals and 1,695 in full text online. For video artefact, there were 2,510 in peer-reviewed journals and 2,876 in full text online. Their eligibility criteria allowed me to reduce them to 121. Finally, the review process provided 28 articles for discussion.

During the first iteration for reduction process, their abstracts and relevant keywords were reviewed. During the second iteration, appropriateness of their methodology, methods and sampling technique were reviewed. In the final stage of the iteration process, the relevance of their findings and its relations to the research questions in this study.

Around 6,880 potential grey studies were found initially with the keywords. Their eligibility criteria allowed me to reduce them to 142 for further evaluations. Then, 72 studies were selected for further analysis. Finally, the review process provided 13 main articles for discussions (university website (n=7), journals (n=5), and government agencies (n=1)). The final list for white and grey literature (Table 2.4, Grey colouring indicating grey literature) is shown:

	Author	**Resource**	**MMA Category**
1.	ahmed Shafi et al.(2018)	LANC One-search, Taylor & Francis, Social Science & Humanities	Online-written
2.	Alharbi et al.(2017)	Association for Learning Technology, Annual Conference, UK	All
3.	Bloxham and Campbell(2010)	LANC One-search, Taylor & Francis, Social Science & Humanities	Paper-based/Online-written
4.	Broadbent et al.(2018)	LANC One-search, Taylor & Francis, Social Science & Humanities	Audio/Online-written
5.	Cann(2014)	LANC One-search, Taylor and Francis Online	Audio/Online-written/Paper-based

6.	Carruthers et al.(2015)	Ulster University website	Paper-based/Online-written/Audio
7.	Chew(2014)	Emerald Group Publishing, UK	Audio/Online-written
8.	Crook et al.(2012)	LANC One-search, Wiley Online-Library Journals	All
9.	Doan(2013)	LANC One-search, DOAJ Directory of Open-Access Journals	Online-written
10.	Ellis(2013)	LANC One-search, Wiley Online-Library Journals	Paper-based/Online-written
11.	Ferrell and Stewart(2014)	EUNIS Journal of HE, EU	Online-written
12.	Ferrel and Gray(2016)	JISC, Guidelines, Government website, UK	Online-written
13.	Gikandi et al.(2011)	LANC One-search, Elsevier Science Direct Journals Complete	All
14.	Gould and Day(2013)	LANC One-search, Taylor & Francis, Social Science & Humanities	Audio/Online-written
15.	Harrison et al.(2015)	LANC One-search, Taylor & Francis, Social Science & Humanities	Online-written/Audio
16.	Hattie and Yates(2014)	Review of Educational Research, American Psychological Association	All
17.	Hayman (2018)	DOAJ Directory of Open Access Journals	Audio
18.	Henderson and Phillips(2014)	Monash University website	Video/Online-written
19.	Hepplestone et al.(2011)	LANC One-search, DOAJ Directory of Open-Access Journals	Video/Audio/Online-Written/hard copy
20.	Johnson and Cooke(2016)	LANC One-search, Taylor & Francis, Social Science & Humanities	Audio/Online-Written

21.	Lamey(2015)	LANC One-search, Wiley Online-Library Journals	Online-written/Video
22.	Lunt and Curran(2010)	LANC One-search, Taylor and Francis Online	Audio/Online-written
23.	Marriott and Teoh(2012)	LANC One-search, Taylor & Francis, Social Science & Humanities	Video/Audio/Paper-based
24.	McCarthy(2015)	LANC One-search, DOAJ Directory of Open-Access Journals	All
25.	Morris and Chikwa(2016)	LANC One-search, Sage Journals	Online-written/Audio
26.	Mulliner and Tucker(2015)	LANC One-search, Taylor & Francis, Social Science & Humanities	Paper-based/Online-written
27.	Nemec and Dintzner(2016)	LANC One-search, Science Direct	Audio/Online-written
28.	Parton et al.(2010)	International Journal of Instructional Technology and Distance Learning	Video/Paper-based
29.	Phillips et al.(2016)	LANC One-search, Proceedings ASCILITE	All
30.	Pitt and Norton(2016)	LANC One-search, Taylor & Francis, Social Science & Humanities	Online-written
31.	Rebecca and Tannous(2015)	Queensland University website	Paper-based/Online-written
32.	Reed et al.(2015)	LANC One-search, DOAJ Directory of Open-Access Journals	Paper-based/Online-written
33.	Sopina and McNeill(2015)	LANC One-search, Taylor & Francis, Social Science & Humanities	Paper-based/Online-written
34.	TELED(2016)	Bristol University website	Online-written
35.	Van der Hulst, et al.(2014)	Leiden University website	Paper-based/Online-written

36.	Venable et al.(2012)	Curtin University website	Paper-based/Online-written
37.	Voelkel and Mello (2014)	LANC One-search, Taylor and Francis Online	Audio/Online-written
38.	Watkins et al.(2014)	LANC One-search, DOAJ Directory of Open-Access Journals	Paper-based/Online-written
39.	West and Turner(2016)	LANC One-search, Taylor & Francis, Social Science & Humanities	Video/Online-written
40.	Westwater-Wood and Moore(2016)	www.mededpublish.org, Dundee University	Audio/Online-written/Face-to-face
41.	Zimbardi et al.(2017)	LANC One-search, Assessment & Evaluation in HE	Audio/Online-written

Table 2.4: List for white and grey literature

2.1.3. Review of Data Findings

2.1.3.1. Online-Written Artefact in SAF

When compared to traditional paper-based media, online-written artefact in SAF activity allows read, write, and commenting within the same sentence/page as interactive webpages. Additionally, the Education Development Department website at Bristol University (TELED, 2016) highlights new possibilities of annotating SAF outside VLEs with offline mobile applications, such as Notability or i-Annotate. As the majority of recent studies about SAF activity focus on online-written artefacts as an integral part of institutionalised VLEs, they often conclude SAF with online-written artefact to be an acceptable format through its familiarity, ease of access and professionalism goals in HE (Table 2.5). For example, Hepplestone

et al. (2011) argue in their literature review that the use of an online-written artefact could lead students to see areas requiring focus and attention comprehensibly because they are already familiar with getting paper-based written feedback. Furthermore, these findings are also consistent with Ferrell and Stewart (2014) and Van der Hulst et al.'s (2014) findings as grey literature, reporting that the majority of lecturers find interactive text functions in SAF to make their marking faster and more efficient from their perspective.

Benefits of online-written artefacts in SAF	**Publications**
Suitability (security, accessibility, and convenience). Professionalism. Storage ability to re-access and review again.	Reed et al.(2015), Ellis(2013)
Efficiencies from staff perspective such as its speed, ease of access, reduced workload and responsiveness. Improving academic writing style. Re-editing their feedback in a document as they go through it, re-using common feedback and using hyperlinks to direct resources.	Venable et al.(2012):Grey literature TELED(2016):Grey literature
Consistency of marking, increased quantity of feedback and level of personalisation. Allowing growth in e-learning.	Carruthers et al.(2015)
Timeliness and accessibility of feedback due to its immediate availability via computer with internet access.	Watkins et al.(2014) Van der Hulst, et al.(2014)

Annotation was valuable for detailed and individualised feedback. Clarity. Standardisation.	Watkins et al.(2014), Van der Hulst et al.(2014),
Students are satisfied with quality, efficiency and convenience of submitting assessments and accessing feedback.	Rebecca and Tannous(2015): Grey literature
SAF is stored alongside learning materials, enabling students to refer these easily.	TELED(2016)

Table 2.5: Benefits of online-written artefacts

In contrast, several studies do not align with these positive findings for the use of online-written artefacts in SAF. For example, despite being the most common format, Henderson and Phillips (2014) report that online-written comments are often limited indepth and open to more than one interpretation causing uncertainty, while face-to-face SAF discussions are also impractical and reliant on student memory, and therefore an audio artefact in SAF is a better solution for students. Furthermore, through surveying first-year nursing students (n=335) in New Zealand, Sopina and McNeill (2015) analysed two different MMAs in SAF (i.e. paper-based: assignment 1 and online-written: assignment 2) focusing on their differences in format and methods of delivery impacting on its quality. Whilst SAF format, delivery method and quantity variables are predictors of student OSO, there are no changes in students' OSO with SAF formats and delivery methods between online-written (n=140) and paper-based (n=168) artefacts. Notably, the survey

results show that online marking activity could provide more timely feedback for students without affecting SAF quality. However, as "the students finding the format useful are more likely to be overall satisfied with their feedback" is one of the predictors in the study, the qualitative findings of lecturers (n=6) state that quality in online SAF is improved by being in a more structured and focused layout, consistency of feedback with automated standard comments, word count, grammar and spell checker, and ease of reviewing the related online text references. The lecturers suggest that they are likely to give more feedback in online SAF, and so online marking operations make the SAF more professional. In my view, lecturers in the study have improved the SAF format and delivery methods that affect quality with the use of online-written artefact (assignment 2), despite no increase or decrease recorded in the students' OSO with SAF activity. Thus, the findings can either indicate a contradiction between lecturers' perceptions of its quality (usefulness) goal and actual students' learning experiences, or be equally attributed to the context of these two assignments (1 and 2) being completely different with their separate purposes (i.e. assessment outcomes). Nevertheless, it is reported that female students are more likely to be satisfied with their paper-based feedback than male students. Finally, age or English for Speakers of Other Languages (ESOL) groups are not significant predictors of student OSO with quality of SAF activity in the study.

Although online-written artefacts in SAF are useful for referring directly to new digital resources (Sopina and McNeill, 2015), consistency and quality of feedback are affected negatively by different lecturers' comments and their approaches to SAF quantity (Watkins et al., 2014). Besides, annotated feedback has a risk of restricting SAF and student engagement by being limited to margins of essays or rubrics through standardisation attempts of SAF with online-written artefacts (Phillips et al., 2016). For example, regarding nursing students' (n=296) perceptions of online-written artefacts in SAF for essay type assignment at Cardiff University, Watkins et al. (2014) report that more than half are satisfied with online-written artefacts in terms of being constructive, sufficient quantity to be meaningful and easy to understand goals. Equally, these findings can imply that online-written annotated comments or generic comments do not essentially change lecturers' writing styles due to standardisation attempts.

Next, McCarthy (2015) examines online-written, audio and video artefacts in SAF activity. Despite online-written feedback being cheaper, faster to produce, and perceived as more formal (i.e. professionalism) than any other format in HE; online-written artefact becomes static, lacks visual or aural elements, and so is perceived as less substantial and detailed by students. Meanwhile, negative emotions such as isolation and loneliness occurring from lack of interactions can adversely affect the lecturer-student

relationship and engagement and, therefore, their teaching-learning experiences in TEL environments (Alharbi et al., 2017). Hence, enhancing emotional connection with lecturers by means of audio and video artefacts can provide the feeling of physical presence personality and connectedness via aural and visual presentations for students interacting remotely. Also, McCarthy (2015) reported that male students (13%) find written online-written artefacts in SAF less useful than female students (34%) and, therefore, male student engagement could be increased with the use of audio or video in SAF. Additionally, paper-based artefacts in SAF are confusing for many students with disabilities and some find higher volumes of written text in SAF for essay types of assignment demoralising (Sherman and Pullen, 2017). Finally, due to their lecturers' familiarity with online-written artefacts, students can still prefer online-written feedback to audio for its quality and standardisation, and therefore lecturers' engagement with new approaches and training for different MMAs in SAF is equally important (Johnson and Cooke, 2016).

In conclusion, SAF with online-written artefacts becomes a necessity in e-learning due to online management of assessment operations. In addition to its convenience in monitoring purposes and consistency of marking for lecturers; online-written SAF has immediate availability in electronic format, security, storage, accessibility, larger volume in quantity, professionalism, and

personalisation (i.e. coloured, bold, highlighted) goals for e-learning students.

As online-written communication method is currently a common practice in HE environment, it is evident that SAF with online-written artefacts can encourage students to think about their writing style. However, aural and visual communications still play a major role in our lives. Online-written artefacts could inevitably restrict students to online-written communications, resulting in their restricted understanding of lecturers' SAF presentations by limiting their ability to initiate meaningful dialogues with lecturers (Bloxham and Campbell, 2010). On the contrary, YouTube (i.e. video format) is ranked second, Facebook/Instagram (i.e. mixture of video, audio, and online-written formats) is ranked third for access and popularity but Wikipedia (i.e. online-written) is only ranked fifth (Alexa Internet, 2018). Therefore, the use of different MMAs has clearly become crucial for improving student engagement with SAF in the current generation of learners (Evans, 2013).

2.1.3.2. Audio Artefact in SAF

Firstly, McCarthy (2015) highlights six key goals of SAF with MMAs as frequency, focus, timeliness, appropriateness, suitability, and engagement in SAF with MMAs to influence positively student satisfaction. Furthermore, for the first-year students (n=68) in two-stage graded summative assignments on laboratory reports, Morris and Chikwa (2016) report that although students are satisfied with

audio artefacts in SAF over online-written, their preference on future assignments are still for online-written artefacts due to its helpfulness goal about learning from SAF and making sense of comments. However, their qualitative findings demonstrate various students' intentions to use audio artefact as "re-reading being less stressful than rewinding audio" and "written text can be skipped to read again for important parts", relating to its length, focus and sufficient quantity to be meaningful. Additionally, regarding its research design, the first intervention (receiving audio artefact) had been conducted on assignment 1 (50% of overall-grade) in the first semester, while assignment 2 for receiving online-written artefacts' (50% of overall-grade) was in the second semester. However, many students still consider formative feedback to be more helpful for their improvement needs than final summative assessment activities (Zimbardi et al., 2017) because they tend to search for specific information to help their future assessment performance (Ahmed Shafi et al., 2018). Hence, in the Morris and Chikwa (2016) findings, it is possible that immediacy of helpfulness goal in assignment 1 is linked with assignment 2 as a final point of assessment. In my view, unless either the same interventions with audio artefacts were conducted on assignment 2 in the second semester or the control groups were receiving the same intervention in reverse order; timing of the inventions and students' historical perceptions of SAF activities can also play a role. Meanwhile,

McCarthy (2015) evaluates online-written, audio and video in SAF and concludes that compared to written feedback and video feedback, audio is the least favourable multimedia artefact due to a lack of visual elements involved. However, some students do not consider video and audio artefacts to be formal feedback compared to online-written, as their concern for professionalism goal (McCarthy, 2015).

Secondly, to measure the potential goals for audio artefacts in SAF, Lunt and Curran (2010) examine qualitative opinions from students (n=26). Consistent with Cann (2014) and Voelkel and Mello's (2014) findings, the authors suggest that very few students are collecting their SAF with paper-based artefacts, whilst more are likely to access audio files through mobile learning. In the study, while teaching experiences of lecturers are positive for its efficiency motive about production time of audio artefacts, a high student OSO is also reported for ease of access, mobility, storage, quality, and providing more details in audio feedback over written text artefacts. This is because the audio in SAF mediates monolog for wider, concise, personalised, and richer than the formal academic writing style in online-written artefacts. These findings also align with Hayman (2018) about work-based postgraduate sport science students for distance learning. Nonetheless, the Lunt and Curran (2010) study does not find audio artefacts to provide any higher achievement rates compared to online-written in SAF. Similarly,

Carruthers et al. (2015) surveyed undergraduate business studies students (n=113) with four case studies of audio feedback to conclude that the majority of students and lecturers prefer audio feedback through a level of personalisation, clarity, easy access, usefulness, constructive, higher quality and quantity. However, students would still like to see it used together with completed assessment grids and hard copies of their annotated work in the study.

Furthermore, to understand mediating effect of audio and online-written artefacts through lecturers' language usage in their descriptions by a software tool, Nemec and Dintzner (2016) analyse SAF content and quantity between audio and written artefacts with a psychometric linguistic inquiry method amongst pharmacy students (n=10). Evaluations on SAF content show that positive emotional word counts are twice as high as negative emotional counts in audio. However, comparing audio to written feedback, negative emotional words in audio are almost six times less than in written text on average. Yet, affective processes (all feelings and responses for formal styles rather than just directed emotions) results are much higher in written words than audio on average. Evaluations on SAF content also show that word counts in audio artefacts are eight times higher than online-written on average. As a result, the students are likely to find audio in SAF more personalised and useful than written SAF through its effectiveness

motive. Similarly, in larger student cohorts, Zimbardi et al. (2017) report that lecturers (n=38) using a mixture of audio and online-written feedback in the same assessment are producing eight times as many words as in audio compared to online-written comments too. However, contradicting with Lunt and Curran's (2010) findings for audio being faster to produce, Voelkel and Mello (2014), Westwater-Wood and Moore (2016), and Zimbardi et al. (2017) demonstrate providing audio feedback to take 90 seconds longer on average for lecturers in one-page assignments than online-written SAF. Such evidences also align with Lunt and Curran (2010) and Harrison et al.'s (2015) qualitative findings about tone of lecturers' voice providing more information, informal, and easier to interpret by students. Nonetheless, while audio artefacts enable lecturers to provide more detailed feedback than online-written, there is a risk of students' attention diminishing during long asynchronous recordings (Hepplestone et al., 2011).

Thirdly, Cann (2014) suggests a mixture of observations in laboratory notebooks to be difficult to convert into online-written format, and so, proposes audio-only feedback to be a better alternative through an easy access goal in SAF. Cann's (2014) study design involves a variety of SAF activities taken by first-year biology students (n=31) receiving both online-written and audio (three minutes long) feedback simultaneously in GradeMark™, second-year students (n=170) receiving audio-only for shorter essays (three

minutes long), and third-year students (n=25) receiving audio-only for larger essays (between three and five minutes long). Subsequently, the audio-only artefact is a better solution for the second and third-year students with its popularity, and provides better engagement with timeliness, connectedness, and perceived relevance goals. However, the author also addresses that many students do not find the online-written SAF system (GradeMark™) easy to use despite receiving additional support materials, aligning with Rebecca and Tannous's (2015) findings about undergraduate students' (n=138) unfamiliarity with the SAF system. Additionally, Cann (2014) is concerned with the online-written SAF system to deliver the grades to the student before receiving their feedback. Notably, Cann (2014) suggests personalised audio feedback to be better suited to longer essays or more reflective assessments, as opposed to shorter ones, because production and delivery of individual audio files for shorter essays in larger cohorts do not necessarily justify lecturers' and support staff time requirements.

Then, aligning with McCarthy's (2015) findings and Chew (2014) in a grey literature for audio being more positively received by international students (ESOL) (36%) than local students (6%) in SAF, the ESOL group often find the human voice in audio more engaging than online-written artefacts. This is because they appreciate the effort spent by lecturers to provide feedback personally by talking to them asynchronously. However, there is a

risk of a high percentage of ESOL groups finding it more difficult to understand verbal communications and various accents in audio artefacts without visual clues in the UK (Voelkel and Mello, 2014).

Next, similar to my study context for observing OSCE, Harrison et al. (2015) consider the use of audio in OSCE feedback amongst third-year medical science students (n=92, 65% response rate) to improve student OSO from the previous year online-written artefacts. The majority of students (n=83, 90%) find audio artefacts useful for easily understanding their strengths and weaknesses in detail. Additionally, many (63%) suggest audio artefacts to change the way they perform a skill. To highlight its personalisation goal in their qualitative comments, they suggest that the audio artefact mediates the tone of the lecturer's voice to provide more information for easily interpreting the feedback than written words. On the contrary, from the lecturers' (n=28) perspective, while some (36%) are still unsure and even disagree (21%) on the use of audio artefacts in OSCE, around half (43%) agree that the audio artefact in OSCE are an easy to create and acceptable method for providing feedback. However, whilst the OSCE feedback is a similar activity to my own study design, the methodological differences in Harrison et al.'s (2015) study design must also be mentioned. For example:

- The intervention group design in my study includes both the first-year undergraduate and postgraduate nursing students' experiences.

- As opposed to first-year undergraduate nursing students, Harrison et al. (2015) report medical students taking OSCE in their third-year for the first time. This would imply that the first-year nursing students have spent less time in HE and TEL environments for their cultural and historical developments of SAF activities. Conversely, the postgraduate nursing students will already have previous learning experiences with an OSCE context, as opposed to the third-year medical students.
- Harrison et al.'s (2015) do not consider the use of video in OSCE.
- Intervention groups in my study will receive all three MMAs in OSCE simultaneously. However, Harrison et al.'s (2015) study design does not consider using other MMAs at the same time for coherent understanding of student experiences.
- Harrison et al. (2015) do not identify any age, gender, or language differences.

Moreover, Westwater-Wood and Moore (2016) in a grey literature examine the use of audio artefacts in SAF activity by comparing face-to-face, (asynchronous) individual audio, and (asynchronous) group audio artefacts in different student groups. As a result, the audio becomes the most frequently used artefact by 96% for individual feedback (n=43) and 93% for group feedback (n=26) as compared to 71% for face-to-face feedback (n=43). Aligning with

Lunt and Curran (2010), Voelkel and Mello (2014) and Cann's (2014) findings, they indicate that students are more likely to use the audio artefact. The students find individual face-to-face (80%) and individual audio (98%) feedback to be useful but more than half receiving group audio feedback disagree with its usefulness goal. Yet, relating to "their questions about the assessment being addressed", the most popular SAF type is face-to-face (57%, n=43) to any audio format of individual (43%, n=43) and group (3%, n=26). In my view, such findings could relate to visual clues (i.e. body language and hand gestures to aid verbal communication) being absent in audio feedback in comparison to video with its additional signals (McCarthy, 2015). Besides, dialogue in audio artefacts is asynchronous from lecturer-to-student as opposed to synchronous face-to-face discussions. Relating to my own TEL practice, although understanding the differences between individual and group audio feedback is important, Westwater-Wood and Moore's (2016) study could have been more relevant if the interventions were designed in asynchronous (individual/groups) online-written, video and audio, instead of a face-to-face synchronous format.

Lastly, when the audio artefact is considered, its pedagogical designs in SAF affecting student OSO must also be discussed. For example, Broadbent et al. (2018) highlight that any SAF with multimedia design features would still require a balanced

combination of exemplars, rubrics and audio feedback, with a particular focus on SAF with audio artefacts by surveying larger undergraduate cohorts (n=1675) in different learning modes (on-/off-campus). In comparison to online-written artefacts, SAF with audio had increased the students (n=1675) satisfaction rates from 79% to 88% over a three-year period between 2010 and 2013. With the inclusion of online exemplars in 2014, the students' (n=1553) satisfaction rates in SAF have reached around 95% on average over the following three years and exemplars have become the most frequently accessed online resource in 2016. Despite audio artefacts improving personalisation, providing more information and time-efficiency goals in SAF (Harrison et al., 2015), Broadbent et al. (2018) also argue for online-written exemplars to allow students 'seeing what quality looks like and how to demonstrate it in their assignments'. In my view, such an argument could equally undermine effects of auditory descriptions in SAF with audio, favouring textual representations in online-written exemplars.

Finally, although many students find audio artefacts in SAF supportive, personalised, and more comprehensive than online-written artefacts, some lecturers and students can still favour audio feedback less due to their own learning styles such as visual (spatial understanding with image and body language), written text (solitary and intrapersonal) or kinaesthetic (face-to-face and synchronous talk) (Gould and Day, 2013). In my own TEL practices, continuous

training sessions for lecturers, evaluating lecturers-students responses in various contexts, technical support, organisational assessment policies for promoting online management of assessments, and focusing on effectiveness, efficiency and transformation motive through good-practice examples, can encourage SAF communities to better understand the use of audio artefacts and change any cultural-historical concerns on causing such negative responses. In fact, this becomes more evident in Broadbent et al.'s (2018) study that student OSO for SAF with audio (without any other pedagogical interventions) have steadily increased (from 79%, to 87%, to 90%) respectively over a three-year period within a large cohort of students.

In conclusion, although the use of audio artefacts in teaching-learning activities has already been established in the literature, the views on its use in SAF are currently far less consistent compared to online-written. Therefore, its motives in SAF activities should be carefully considered. For example, due to high speed, various accents and lack of visual clues, the audio artefacts in SAF can be challenging for ESOL groups. Moreover, not necessarily considering audio artefacts to be formal (concerning the professionalism goal) in comparison to the online-written artefacts in SAF can be resolved through lecturers' training and students' increased familiarity of its innovative use. Evidently, the SAF goals for easy to create/access/use, speed, accessibility, larger quantity, and

convenience in monitoring online access can still make the audio artefact a viable option in technology-enhanced teaching for lecturers. Consequently, it is important to recognise that new teaching-learning processes take place with different instructions and presentation styles in SAF with audio (Hattie and Yates, 2014) and therefore, these artefacts in SAF can be used for its effectiveness, efficiency and transformation motives as a vehicle to change teaching-learning experiences and OSO.

2.1.3.3. Video Artefacts in SAF

- **Comparison of Video, Audio, and Online-Written**

Firstly, McCarthy (2015) evaluates the students' (n=58) use of various MMAs in three different SAF contexts in a survey. Three different summative assessment activities within the same module were using audio artefacts for the first assessment, video artefacts for the second and online-written artefacts for the final, respectively. While the marking operation for each student assignment took around 15 minutes in the first (audio) assignment, creation of its final audio feedback was around 2 minutes. Having spent almost 25 minutes for marking the second (video) assignment, each student received a 4 minutes long video feedback. Lastly, for the third (online-written) assignment, it took around 20 minutes marking for each student assignment and online-written artefacts were sent in the final assessment. Its results indicate that the student OSO for video feedback is the highest (66%), the

written feedback is the second (22%), followed by audio (12%). To measure the students' future choices, the ranking was the same, as 91% responded positively towards video artefacts. Additionally, the video artefact is more positively received with male students (71%) than female students (59%) in the study. However, there were also differences between national (Australian) students (68%) and international students (55%) who found the audio artefact more difficult to understand compared to online-written, which is inconsistent with Voelkel and Mello's (2014) findings in the UK. Besides, despite highlighting gender and international students' differing multimedia artefact choices, McCarthy's (2015) study did not produce any relevant age breakdown or degree level relevance. Although McCarthy's (2015) findings are relevant to my research by comparing all three MMAs in SAF, there are major study-design differences. Firstly, while McCarthy (2015) uses a three-stage graded SAF approach within the same module, I aim at conducting the interventions in the same SAF with three different MMAs simultaneously. Secondly, although McCarthy (2015) breaks down students in demographic factors as national/international students, I intend to use this category for English as a first language/second language. Similar to my own life experience in the UK, national student groups could include both English as a first language (EFL) and ESOL populations. Subsequently, international student groups

could consist of students both with ESOL and EFL individuals in the same category.

Meanwhile, by sampling two different academic subjects in Australia, Phillips et al.'s (2016) findings suggest SAF with audio and video artefacts to be clearer and more useful for students (n=164) than online-written. However, the findings also indicate that the use of audio or video artefacts alone do not necessarily ensure higher OSO rates due to a risk of wider contextual micro/meso/macro level factors negatively affecting teaching-learning experiences in different academic subject studies. Yet, although wider contextual factors can relate to cultural-historical developments of SAF activities, Phillips et al.'s (2016) findings do not consider any students' demographic differences (e.g. gender, age, ESOL, study modes or study levels) in the TEL environment.

- **Video through Pre/Post-Use Surveys**

Crook et al.'s (2012) findings about SAF with video artefacts changing teaching-learning experiences are often cited in the latter literatures. The authors explore the use of video artefacts with students studying a variety of subjects (n=287) in their degree programmes by two different design stages, i.e. pre-use and post-use surveys. The pre-use questionnaire results indicate that while the students favour the online-written artefact and one-to-one (synchronous) discussions, the audio or video are their least preferred choices in SAF. Then, during the post-use questionnaire,

the majority (80%) prefer SAF with the video artefact and would like their lecturers to continue using it. Additionally, the positive impact on enhancement of feedback provision is reported as an attribute of video artefacts in the academic community. However, this is inconsistent with Westwater-Wood and Moore's (2016) (grey literature) findings that the audio artefact is more useful for individual feedback than group feedback, and only some students (31%) in Crook et al.'s (2012) study mention that a video artefact in SAF works for individual feedback delivery over small groups (51.4%) and generic feedback (47.6%).

- **Comparison of Video and Online-Written**

Students often describe benefits of the video artefact as being conversational, supportive, and motivational by providing direct expressions with a sense of belongingness and closeness to their lecturers compared to the online-written artefact in SAF (Hall et al., 2016; Borup et al., 2014). This is due to the lecturers' body language, posture, gesture, and tone of voice that can create enriched forms of communication by providing engagement, focus, make content easier to understand and provide personalisation as positive goals of video feedback compared to the online-written artefact in SAF (Lamey, 2015). Furthermore, Henderson and Phillips (2014) explore both undergraduate and postgraduate cohort students (n=126) for their use of five-minute long video artefacts in SAF through mixed-method study design. To compare online-written

and video artefacts, while individual video artefacts were received in the final assignment, the students had already received their detailed written feedback in their first assignment. As more than half (n=33) either prefer or strongly prefer to continue with the video artefact, only a few (n=6) chose to continue with the online-written artefact in SAF. Nonetheless, less than half (n=25) have a neutral preference. Although they describe the video artefact to be personal, supportive, clearer, prompting reflection and useful in their qualitative findings, its limitation is an initial anxiety about seeing the lecturer's face expressing any negative SAF. Yet another weakness from the student perspective is that students are not able to match their video feedback to their written assignment. However, such a weakness could be resolved by a balanced combination of exemplars, rubrics and mediating audio or video artefact in SAF (Broadbent et al., 2018). Similar to Cann's (2014) views for effectiveness and transformation motives being more important than efficiency in audio production time, the lecturers recognise the longer video production time but also consider the video artefact in SAF to be more effective and revitalise students' enthusiasm. Nevertheless, Henderson and Phillips's (2014) findings, suggest no preferential demographic differences between video and online-written artefacts in SAF, contradicting with McCarthy's (2015) results about differing degree level, gender, or ESOL students' experiences.

- **Comparison of Video, Paper-Based-Plus-Video, and Paper-Based-Written**

Despite low participation (n=12), Parton et al. (2010) examine SAF with the video artefact amongst postgraduate students in a blended course. To compare paper-based and video artefacts, three assessment types (paper-based, paper-based-plus-video, and video-only) were designed. The majority (92%) find video-only feedback easier to understand than paper-based-plus-video (83%), and paper-based (67%). Additionally, the majority feel a closer connection with their lecturer in video-only feedback compared to the other artefacts (Lamey, 2015; Borup et al., 2014). Therefore, SAF with video artefacts is described to be simple enough to create for lecturers, considering its positive impact on students. Similar to Cann's (2014) findings for audio-only feedback being more effective than the supplement (text-plus-audio) option, Parton et al. (2010) equally outline the replacement approach (video-only) to be more useful than a supplement approach. However, there is another weakness in the findings of this study. For example, Parton et al. (2010, p.2) conclude that "If audio is beneficial, then it stands to reason that video might be as beneficial or even more beneficial for increasing social presence". In fact, motives and goals of audio and video artefacts in SAF can vary. For example, although video feedback is more popular than online-written and audio feedback respectively due to involvement of additional visual elements

(McCarthy, 2015), in my view, Parton et al.'s (2010) hypothesis/conclusion cannot be proven, unless video, audio, and written artefacts are directly compared each other within the same SAF activity.

- **Comparison of Video, Paper-Based, and Audio**

Marriott and Teoh (2012) examine the use of video artefacts (with screen-casting software) in SAF with a survey (n=124, 86% participation) and five focus groups (n= 26) amongst first-year undergraduate students. The majority (72%) prefer the video artefact to paper-based (7%), audio (4%) and 18% having no preference. Therefore, consistent with Henderson and Phillips (2014), as almost all (99%) find the video artefact easier to follow, the majority (86%) find video was more personal than traditional written feedback by either strongly agreeing or agreeing. Additionally, similar views are verified within the focus groups. The focus groups also confirm that the combination of both audio and visual demonstrations through (i.e. screen-casting) artefacts is helpful, individualised, and personal. Notably, consistent with Henderson and Phillips (2014), there are no significant relationships between different age or gender variables.

- **Comparison of Video and Any Type of Written Text**

West and Turner (2016) surveyed first-year undergraduate students (n=142) to conclude that many students (61%) prefer the video artefact in SAF, with only some (21%) preferring any type of written

artefacts despite their previous familiarity. This ratio is similar with McCarthy's (2015) findings in larger cohorts that the video artefact (66%) is the most popular and any written feedback type (22%) is their least preferred choice. Subsequently, consistent with Henderson and Phillips's (2014) findings, the students find the video artefact clearer than online-written artefacts as well as improving both quality and quantity goals. Nonetheless, as both video and online-written artefacts in SAF were ten minutes long, West and Turner (2016) assert no additional workload reported from lecturers to measure any efficiency element in SAF activity. Similarly, as word counts in audio are eight times higher than online-written on average (Nemec and Dintzner 2016), the quantity of feedback in a ten-minute long video (or audio) artefact would inevitably be larger comparatively than the equivalent text feedback in West and Turner's (2016) findings. Yet, there is a risk of students' attention diminishing during long asynchronous recordings (Hepplestone et al., 2011). Additionally, the focus groups in West and Turner's (2016) study suggest that the lecturers agreed on an initial one-hour training session being sufficient. Yet, in my view, additional training sessions add time and workload to lecturers' availability. Moreover, reducing file size, time for playback-checks, editing, re-recording, and network speed to upload/download files within larger student cohorts can become burdensome (Marriott and Teoh, 2012; Henderson and Phillips, 2014) because SAF with video artefact must

be returned to students within the same period as other SAF types. Hence, West and Turner's (2016) findings are not necessarily valid about "no additional workload being produced for lecturers". Meanwhile, similar to Marriott and Teoh (2012), West and Turner (2016) do not find any significant correlation with gender and age.

2.1.4. Conclusion

The use of different MMAs in SAF is a popular topic in the literature with growing numbers over the last eight years. However, the findings do not necessarily provide a clear argument about how different MMAs in SAF change student learning experiences and improve student OSO. Hence, this review aims to extend the discussions to wider resources available contributing to this topic.

Online-written, audio, and video are three main MMAs in SAF activity that are beneficial to student learning experiences in HE. However, there are presently various terminologies to describe their functions, motives, and goals in the literature. Consequently, the review results show that all three MMAs in SAF activities can clearly change students' experiences and their OSO. Subsequently, the findings indicate that these MMAs are beneficial to SAF teaching-learning experiences in various academic subjects and summative assessment contexts too. Yet, there are very few studies on nursing student populations. Furthermore, it is accepted that several motives (i.e. purpose) and potential goals (i.e. objective) in SAF activities with MMAs play a key role to understand teaching-learning

experiences. Notably, there are some concerns for the use of each multimedia artefact in SAF. Hence, their use must be evaluated carefully to meet all students' and lecturers' needs.

Due to its text-based nature and familiarity in HE, many studies compare the paper-based method to online-written artefacts in SAF activities. Thus, there are more studies under the online-written artefact category in the SAF literature, indicating currently a higher involvement in HE. A growing number of studies support the use of audio artefacts as an alternative to online-written. However, although teaching-learning activities with audio artefacts have already been established, the views and learning experiences on SAF activities with audio artefacts are far less consistent than the other MMAs. Finally, compared to the others, the attention on video artefacts are growing much faster in recent years, and thus indicating a growing interest with mostly positive reactions in terms of students' experiences and their OSO. Despite my intention to focus solely on these three main MMAs, there are other alternative views on blending these MMAs in the literatures too.

To understand students' learning experiences for the use of MMAs in SAF, many studies have used various comparison methods. For example, while the online-written artefact in SAF is often compared to paper-based artefacts, the audio or video artefacts are usually compared to multiple multimedia artefact categories. Nevertheless, the video artefact in various SAF activities often becomes the most

popular student choice with positive evaluations. Nevertheless, there are still tensions between learning experiences of students and teaching experiences of lecturers through various motives and related goals in SAF with MMAs.

As there are often contradictory views on the use of different MMAs in SAF activities, each MMA can potentially have various benefits such as:

- Despite previous familiarity with paper-based artefacts, online-written artefacts are more effective, efficient and promote transformation as main motives.
- Both audio and video artefacts can also provide effectiveness, efficiency and provide transformation in SAF in essay types of summative assessment.
- Audio artefacts in OSCE feedback are more beneficial than online-written artefacts.
- Video artefacts can become more useful, helpful, concise, motivational, constructive, personal, engaging, and providing more information for students than online-written and audio artefacts.
- Audio and video artefacts in SAF enable a higher volume of content than online-written. Therefore, the SAF quantity, content, and quality are often positively affected through the use of audio and video artefacts.

Furthermore, the study level, study subject, language, age, gender, and students with disabilities categories can influence the choice on MMAs in SAF despite the findings being not consistent in the literature.

Finally, the literature review pronounces that there are new sets of instructions and presentation styles in SAF with different MMAs in teaching-learning contexts. Meanwhile, the findings have allowed me to focus on not only the effects of SAF activities with different MMAs but also identification of motives (i.e. purpose) and potential goals (i.e. objective) that the various authors believe contribute to teaching-learning experiences. It is important to highlight that there can be variations to the extent of which any of these motives and factors goals might be emphasised in different studies, depending on their different focus and context in HE. Thus, in my view, the findings of the literature review indicate that the most common goals in SAF with MMAs are its familiarity, usefulness, clarity, easier to remember, faster to learn, paying more attention, easy access, providing more information, personalisation, professionalism, and mobile learning.

2.2. Organisational Rules, Community and DoL

I shall consider organisational "Rules", "Community", and "division of labour" (DoL) as the chosen aspects for my thesis building in part on perspectives from Cultural-Historical Activity Theory (CHAT). My thesis is not a CHAT study, but applies elements of CHAT that help illuminate my research questions in relation to the SAF system. CHAT is a socio-cultural and socio-historical constructivist approach, is a unit of analysis with seven interconnected elements (Subject, Object, Community, Tools, Rule, DoL, and Outcome) (Engeström, 2001). CHAT was chosen over the traditional Activity Theory in order to discuss any changes in interpretation of 'Rules', 'DoL' and 'Community 'elements in terms of tension and contradictions within multi-voiced systems: internalisation and externalisation of the School culture within pedagogical relationships. Despite being asynchronous in different MMAs, SAF teaching-learning operations between lecturer and student allow them to make sense of SAF (i.e. grading, guidance, discussion) through their social, cognitive and computational (emotional behaviours in interacting with technology) practices (Engeström and Miettinen, 1999).

From a CHAT perspective, learning is a personal and connected experience as a social-action (Shasteen, 2014; Granata and Dochy, 2016) in which nursing students are making sense of SAF activity with different MMAs tools by rules, community norms and DoL in the School to change their learning experiences and OSO. While these

elements in a central CHAT system interact with each other through its interconnectedness; these elements can create sources of tension as primary and secondary contradictions in teaching-learning environments (Figure 2.6)

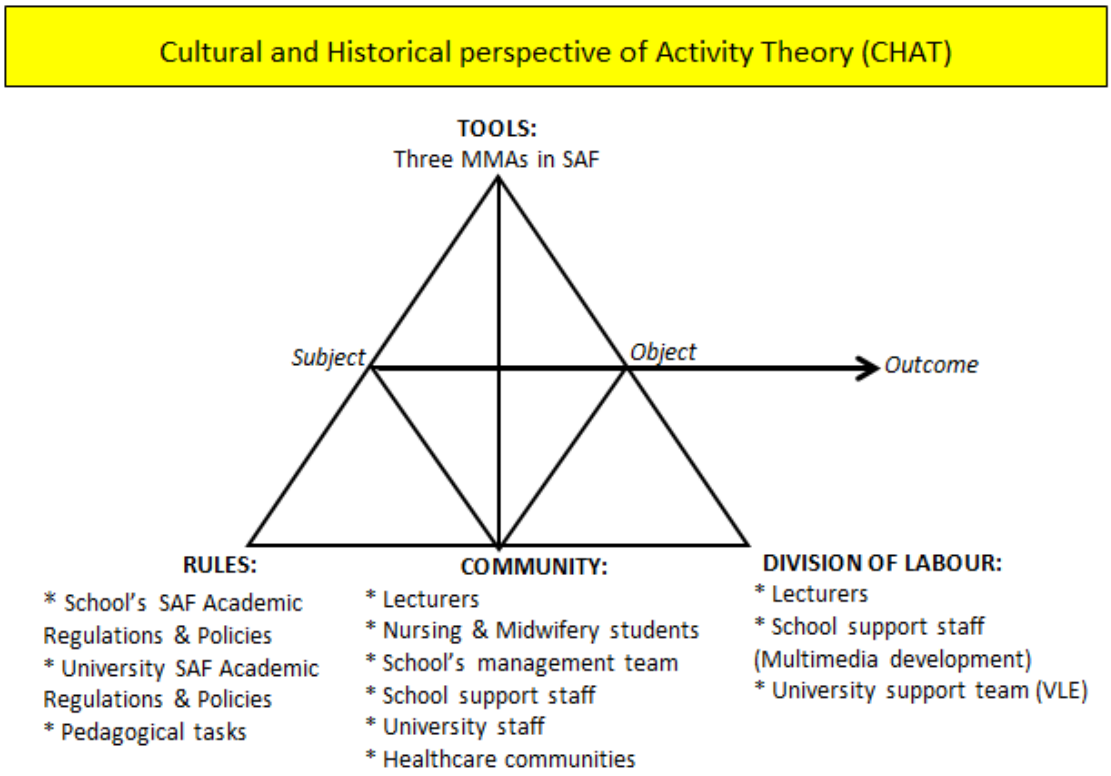


Figure 2.6: CHAT system in the thesis context of SAF and MMA

I aim to provide a broad overview of CHAT elements for a breadth of understanding about the effects of different MMAs in SAF by a quasi-experimental design, and hence I would not be in the position to delve in-depth into CHAT in teaching-learning environments. However, it is still possible to focus on some elements of CHAT to understand particular parts of assessment practices that come to play in terms of different artefact application. Particularly, I aim to adopt the CHAT-based 'DoL', 'rules', and 'community' elements in my analysis and findings section. For example, norms of the School

community include teaching-learning experiences (i.e. familiarity, acceptance, attitudes, intentions to use and satisfaction) for the use of different MMAs in SAF from the School and University members' perspectives. Additionally, the University's choice of its SAF software tool in its VLE leads to all SAF developments with MMAs by its design and tool selections in the School community, affecting engagement, pedagogic adaptations, accessibility, and layout. Additionally, any length (i.e. volume) of SAF with MMAs is decided by the community norms in the School. These norms allow me to discuss any changes occurring between students' previous opinions and latter actual use of MMAs in the same SAF activity.

The School's Assessment Charter (2018) and Summative Assessment Marking Guidance for Staff (2018) documents include both formal and informal SAF rules. There are rules on SAF release dates, only online-written being mandatory in SAF, and mandatory electronic management of all summative assessment activities in the School. Besides, these SAF policies outline not only how SAF with MMA must be produced, but also what SAF contents should be in the School.

Regarding DoL, the lecturers are responsible for producing SAF with different MMAs, while the students are accessing and learning from their SAF content and comments. Such DoL equally identifies a link between learning experiences of students and teaching experiences of lecturers in SAF teaching-learning environments. There are other

DoL including producing accessible multimedia development from the School support perspective and VLE system developments from the University's support services.

Prior to interventions for the use of different MMAs in SAF, the students' perceptions in the School can be understood through potential primary contradictions within each CHAT element. For example, this study will also examine primary contradictions within student subject by demographic predictors:

- Gender
- Age
- Subject (Nursing/Midwifery)
- Level (Postgraduate/undergraduate)
- Mode (Online/blended/face-to-face)
- Language (ESOL/EFL)

In addition, the study will investigate any potential secondary contradictions in the SAF activity for the use of MMAs amongst community, rules, and DoL by means of analysing the School's Assessment Charter document.

Furthermore, historicity of nursing education in Scotland signifies wider contextual forces and power relations for MMAs in SAF. When the multi-voicedness and historicity of nursing education are pronounced, these discussions in the School are surrounded by:

- Students' experiences for MMAs in SAF
- Lecturers' opinions of TEL integration into nursing studies
- The University's own view to implement MMAs and SAF tools in its VLEs
- Health and social care sector members' views

Evidently, any successful future integration and application for MMAs in SAF depend on adopting a coordinated approach between the School's community norms, DoL, and rules. When sources of tension are resolved, the students and lecturers can begin to deviate from current mandatory use of online-written artefacts in SAF. This becomes a collaborative envisioning and deliberate collective effort as a social act to use audio or video artefacts in SAF (Olavarria, 2013). Otherwise, these interconnected relationships can deteriorate and result in students' dissatisfaction in the School.

2.3. Teaching-learning Experiences Relating to SAF with MMAs, Student OSO, Motives and Goals: Integrative Review

The following key themes are discussed:

- Teaching-learning experiences and (dis)satisfaction
- SAF and MMAs
- Motives and goals in SAF with MMAs

2.3.1. Teaching-Learning Experiences and Satisfaction

By solely focusing on learning activities, Forbes et al. (2016) outline the use of video artefacts for learning of clinical skills in nursing education to be a promising future direction of research through its effectiveness, efficiency, usage, and quality strategies in TEL. Yet, while this is appropriate working within TEL environments from a practice perspective, it should be equally recognised that there are distinctions between different perspectives of SAF activity contexts, including Technology-Enhanced Management of Education (e.g. wider student population engaging with SAF in the design of online learning for selecting the MMA tools), Technology-Enhanced Education (e.g. online SAF delivery from lecturers about student results), Technology-Enhanced Learning (e.g. learning experiences of students) and Technology-Enhanced Teaching (e.g. SAF teaching experiences of lecturers) (Passey, 2019).

Regarding SAF contexts, by producing different types of information in their feedback (Boud, 2017), there is a tension between summative and formative assessment activities through their procedural applications (dictative/indicative), timeline, measurement results, levels (high-stake/low-stakes) and nature (formal/informal). For example, student engagement with SAF is much lower than formative assessment feedback, since students consider formative assessment feedback to be more useful and helpful for their own improvement needs than SAF (Zimbardi et al., 2017). Furthermore, there are procedural differences on timing of assessment, such as summative assessment being for final evaluations and grading purposes, as opposed to formative assessment conducted during their learning activities. Similarly, their level of importance (high/low-stake), attendance (mandatory/optional), and nature (formal/informal) are described as complementary (Dixson and Worrell, 2016). Therefore, SAF is often associated with its 'pass/fail' results in validation and accreditation processes in HE, as opposed to formative assessment feedback building up students' knowledge for their success in the latter summative assessment activity (Bloxham and Campbell, 2010; Henderson and Phillips, 2014). Hence, SAF activities often become a judgement summary of all final evidences aligned with learning outcomes and assessment criteria (Broadbent et al., 2018; Phillips et al., 2016). However, although these operations are

already established in learning-teaching contexts, alternative strategies are also proposed such as assessment feedback activities forming a continuous process (i.e. not two separate or fixed) concerning a student learning journey until graduation (Bloxham and Campbell, 2010; Jackel et al., 2017). Nevertheless, amongst these definitions, Gikandi et al. (2011) and McCarthy's (2015) definition of feedback aligns with my own experience of SAF being "assessment *of* learning", and formative assessment feedback being "assessment *for* learning" in HE. Thus, I consider formative and SAF to be two distinctive activities in the study.

Assessment feedback activity is currently a popular topic in universities and conferences because HE student satisfaction rates with assessment and feedback processes in the National Student Survey (NSS) has been historically low for over a decade in the UK (HEFCE[1], 2016; HEFCE[2], 2017). The NSS 2017 survey consists of twenty-seven closed-category questions with overall dissatisfaction percentages of 'Definitely-Disagree' and 'Mostly-Disagree' options being negative emotions and both 'Definitely-Agree' and 'Mostly-Agree' options being positive emotions on a five-point Likert-scale for measurements of OSO. As I use the identical five-point Likert-scale measurement in this study, the relevant connections for measuring student experiences and their OSO should be mentioned. For instance, firstly, in NSS surveys, closed-category questions are about adding up three years of various SAF experiences of students

leading to certain generalisations being made, and so, only putting an emphasis on overall positive or negative emotions in students' entire HE journeys (Warner, 2016). Secondly, there are also new amendments in the NSS 2017 survey by modifying three questions under the 'assessment & feedback' category to clarify meaning of the previous questions (HEFCE[2], 2017). In this category (Table 2.7), while two questions (q6 and q7) in 2016 were amended for clarification (i.e. becoming Q9 and Q10) in 2017, the last two questions (i.e. q8 and q9) in 2016 were merged into a new one (Q11) in the 2017 NSS survey.

NSS Survey Questions, 'Assessment & Feedback' Category
2016 NSS Survey Questions
q5 - Criteria used in marking have been clear in advance.
q6 - Assessment arrangements and marking have been fair.
q7 - Feedback on my work has been prompt.
q8 - I have received detailed comments on my work.
q9 - Feedback on my work has helped me clarify things I did not understand.
2017 NSS Survey Questions
Q8. Criteria used in marking have been clear in advance.
Q9. Marking and assessment has been fair.
Q10. Feedback on my work has been timely.
Q11. I have received helpful comments on my work.

Table 2.7: NSS Survey (HEFCE2, 2017)

Nevertheless, despite differences in measuring each question between NSS 2017 and the earlier surveys, their comparisons can still provide an awareness of changing student experiences and OSO. Furthermore, while eligibility criteria in NSS surveys include only the final-year undergraduate nursing students and students studying NHS-funded subjects (NSS[1], 2018), it excludes other students. In this study, I aim to include all student populations in the School-wide survey with the identical five-point Likert-scale so that these findings can be related to NSS results. Regarding NSS results in the UK, for example:

- Around only 40% of students are still overall dissatisfied with clarity and promptness of assessment feedback provided in the NSS 2010 survey (Marriott and Teoh, 2012).
- 73% are satisfied with their overall 'assessment & feedback' experiences in 2017 (HEFCE[2], 2017), similar to 74% in 2016 (HEFCE[1], 2016). While an increase from 60% (2010) to 73% (2017) is a positive trend on the total average, this category has still the lowest percentage amongst all other categories (i.e. teaching (87%), academic support (82%), learning resources (86%), personal development (82%), and OSO (86%)) in 2017.
- Notably, there are also regional statistical differences (named "Country by Scale") in 'assessment & feedback' experiences.

For example, while overall 'assessment & feedback' satisfaction was around 74% in 2015, 2016 and 2017 in England, Wales, and Northern Ireland; these results were lower in Scotland, i.e. 68% (2015), 69% (2016), and 69% (2017) over the same period (HEFCE[2], 2017).

- A breakdown of the 2017 'assessment & feedback' category for full-time students in Scotland is shown in Table 2.8.

2017 NSS Survey Questions:	**Full time, Scotland** (%)
Q8. Criteria used in marking have been clear in advance.	70
Q9. Marking and assessment has been fair. [amended]	73
Q10. Feedback on my work has been timely. [amended]	64
Q11. I have received helpful comments on my work.[amended]	69

Table 2.8: 2017 NSS Survey (HEFCE[2], 2017)

Notably, in 2017, results in the feedback activities (Q10 and Q11) are much lower than the (marking) assessment activities (Q8 and Q9) in Scotland. Therefore, such a gap between assessment and feedback activities equally highlights the relevance of my study to improve SAF with MMAs in a Scottish university.

- However, on the contrary, overall 'assessment & feedback' satisfaction category results have been higher in the University (where this study is conducted) as 73% (2015), 68% (2016) and 72% (2017) than average OSO results in Scotland. Such differences between the University and the other Scottish universities can be related to the University being an early adopter of TEL as a Post-1992 university with central institutional roots (Scott, 2012). For example, through the University's follow-up report to an enhancement-led institutional review in October 2017 (QQA Scotland, 2018), the university was recommended the standardisation, improvements, and timeliness of SAF:

  "*to be implemented by all Schools to enhance consistency of assessment and feedback practice through online management of all assessment over two years period for:*

  - *Reducing pockets of variability*
  - *Implementing identified good-practices across the University*
  - *Enhancing clarity of feedback timescales"*

Similarly, institution-wide policies about online management of assessments are varied in the UK and thereby their usage and acceptance levels; i.e. eSubmission (electronic submission), eMarking (electronic marking), eFeedback (electronic feedback) and

eReturn (electronic return of marking) (Newland and Martin, 2016). Henceforth, despite its recent increase in use and lecturers' positive views, eFeedback, as an only form of feedback, is supported more on a School level than on an institutional level (Newland and Martin, 2016). Such findings have three major implications in my study.

Firstly, a similar contradiction currently exists between the School and University in the study. For example, although online management of all SAF activities is mandatory in the School since 2016/17 academic year, the University assessment regulations currently do not necessitate the same process. However, responsibility for enhancing a coherent culture of TEL developments lies with:

- Universities to update their SAF strategies/regulations
- Schools' lecturers' views on student engagement, TEL and their training needs
- Organisational software/hardware developments

Unless these TEL developments are supported by the University-wide policies (i.e. resources, technical support and training), such developments tend to stay limited to the School level, and so only driven by enthusiastic practitioners and lecturers as good-practices and pilot studies.

Secondly, there is a need for more empirical research on SAF activities with different MMAs to convince lecturers with neutral

choices for its successful applications (Watkins et al., 2014; Reed et al., 2015). As well as providing necessary evidences for policy makers, TEL researchers should equally focus on uncovering alternative solutions in SAF with different MMAs, rather than solely depending upon online-written artefacts.

Finally, understanding SAF with different MMAs from both student and lecturer perspectives is necessary to solve any potential tensions between organisational TEL developments, engagement and students satisfaction. Hence, exploring SAF with MMAs through both student and lecturer interviews is a key interest for me in this study.

2.3.2. SAF with Different MMAs

The current literature does not necessarily reveal any clear argument about SAF with MMAs, as opposed to their use in teaching-learning materials (Henderson and Phillips, 2014). SAF with MMAs are online-written, audio and video in this study. Alternatively, supplementary formats i.e. text-plus-audio (Cann, 2014), text-plus-video (Parton et al., 2010), and screen-casting (Mahoney et al., 2018) are also proposed for utilising different benefits of these MMAs. However, SAF activity with audio-only artefact changes the nature of the feedback when the focus is on a single artefact (e.g. audio-only) (Broadbent et al., 2018; Hayman, 2018). Therefore, any SAF activity with MMAs requires a balanced combination of exemplars, rubrics, and the MMA because

summative assessment rules and feedback processes must be clear and accessible to all students in advance (Rea and Cochrane, 2008). Nonetheless, the recent studies indicate new changes taking place for the use of MMAs in SAF content, instructions, structure, layout, demonstrations and motivational dialogue through personalisation directly affecting student OSO (Broadbent et al., 2018; Phillips et al., 2016, Nemec and Dintzner, 2016; Hayman, 2018). As MMAs in teaching-learning activities have already been established, including podcasts (audio-only) and flipped classroom strategies (asynchronous video of lecturers); SAF with MMAs can provide continuity of teaching-learning with multimedia through its current familiarity, usefulness, and mobile learning goals.

Meanwhile, although SAF with various MMAs are helpful with its immediate online availability and advanced engagement functions for students, it can become a challenging for lecturers (Crook et al., 2012; McCarthy, 2015). Yet, while OSO growth for the use of MMAs in SAF is more significant in larger student cohorts (Harrison et al., 2015; West and Turner, 2016), a combination approach of both audio-only and online-written is also proposed for efficiency and consistency in larger cohorts (Zimbardi et al., 2017). On the contrary, despite online written feedback possessing characteristics of consistency, easy access, and being faster to produce for lecturers, a degree of its helpfulness for students is dependent on improved communication and being more personalised (Rae and

Cochrane, 2008). This is because their learning process is linked to the online physical presence of their lecturer, including emotional connections in TEL (Martin et al., 2018; Parton et al., 2010; Alharbi et al., 2017).

While I aim to focus on exploring nursing students' experiences, Philipps et al. (2016) similarly recognise the complex and multi-faceted nature of subject-specific practices in SAF with MMAs to shape students' OSO in other academic disciplines (i.e. education and engineering). However, Philipps et al.'s (2016) findings do not consider individual student differences in TEL such as gender, age, English as first/second language, different study modes, subject focus (nursing/midwifery), study levels (undergraduate/postgraduate) or any previous familiarity with different MMAs in SAF activities (optional/mandatory), as opposed to my study design.

2.3.3. Motives and Goals (Variables) As Factors in SAF with MMAs

The mediating role of multimedia for its instrumental conditions should also be discussed to highlight the link between changing learning experiences in SAF with MMAs and student OSO in this study. For example, students' OSO as an outcome is an attitude of evaluating their actual performance to meet own needs and expectations (Karanasios 2014). Similarly, Ada (2018) and Siming et al. (2015) identify TEL tools to mediate interactions as a vehicle

between student experiences and the OSO relationship. Meanwhile, student evaluations of their experiences and OSO change with teaching style, software design, and their previous SAF experiences (Elliott and Shin, 2002).

Aligning with these findings in teaching-learning activities with MMAs, Forbes et al. (2016) identify four main motives of video artefacts as effectiveness, efficiency, usage, and quality affecting student experience and satisfaction in nursing studies. Moreover, McCarthy (2015) highlights, referring to Gibbs and Simpson's (2004) study, six key benefits of feedback as frequency, focus, timeliness, appropriateness, suitability, and engagement to influence students' experiences. Finally, Kirkwood and Price (2014) report, referring to the e-learning strategy from the HE Funding Council for England, "*three different levels of potential benefits in e-learning activities as:*

1. *Efficiency – existing processes carried out in more cost-effective, time-effective, sustainable or scalable manner*
2. *Enhancement – improving existing processes and the outcome*
3. *Transformations – promoting change in existing processes or new processes*"

These different levels in Kirkwood and Price's (2014) descriptions are relevant to my study. However, in my view, due to already established TEL concepts in the current literature, the

"enhancement" motive inevitably embraces both efficiency and transformation motives. By building on these concepts, three motives and their specific goals (variables) as factors generating SAF activity with different MMAs are attributes of educational achievement in the School and categorised into:

- **Effectiveness motive:** Familiarity, Usefulness, Faster to learn, Easier to remember information, Paying more attention, and Clarity goals
- **Efficiency motive:** Ease of access and Providing more information goals
- **Transformation motive:** Personalisation, Mobile learning, and Professionalism goals

The transformation motive of SAF with MMAs as perceived by participants in the study is mediating effects of multimedia artefacts to promote transformation in SAF context. Within this motive, greater levels of personalisation, improved professionalism, and increased capacity of mobile learning with different MMAs can be identified in SAF.

Henceforth, a similar hierarchal structure of Motive-Goal-Outcome relationship is adopted for the introduction (intervention) of different MMAs in SAF activity to understand teaching-learning experiences through SAF effectiveness, efficiency, and

transformation motives and student OSO. Notably, the Outcome element is related to student OSO in the study.

3. RESEARCH QUESTIONS

The main research question:

What are nursing students' and lecturers' opinions for the use of different mediating multimedia artefacts (online-written, audio and video) before and after the introduction (intervention) of new artefacts in relation to their teaching-learning experiences through Summative Assessment Feedback (SAF) in testing effectiveness, efficiency, and transformation motives and student overall satisfaction outcomes (OSO)?

Related sub-questions are:

SRQ1. Prior to the intervention, what are the nursing students' perceptions for the use of different mediating multimedia artefacts (MMAs) in SAF activities in relation to their learning experiences and OSO in the School?

SRQ2. Following the intervention, what are the nursing students' perceptions for the actual use of different MMAs in SAF activities in relation to their learning experiences and OSO in the School?

> **SRQ2.1.** Does the actual use of different MMAs in summative OSCE assessment feedback activity change the nursing students' learning experiences through its effectiveness, efficiency, transformation motives and their OSO in the School, and how?

SRQ3: What are the reported difficulties and strengths of lecturers' teaching experiences in summative OSCE assessment feedback for

the use of different MMAs, relation to the School community, rules, and division of labour?

4. METHODOLOGY AND STUDY DESIGN

This chapter presents adapted DBR methodological framework of the intervention, a case study approach design using mixed-methods, my design in context as ontological position, and analysing the School SAF culture through teaching-learning experiences and their OSO.

4.1. Adapted DBR Methodological Framework

By means of its Design-Based Research approach (DBR) as a methodology, this study focuses on the actual use of three MMAs in the same OSCE feedback activity to learn from nursing students' and lecturers' experiences and their OSO in SAF teaching-learning processes. Kennedy-Clark (2013, p.1) summarise the DBR approach to:

"*Develop and refine design of artefacts, tools and curriculum, and advance existing theory supporting and leading to a better understanding of learning in real educational settings*".

Notably, this study is not a common DBR design research as it does not have any iterations, but it has an intervention that explores a teaching-learning design with different MMAs. Regarding its DBR strategies (Table 4.9), the study employs (sequential and exploratory) mixed-methods of data collection to allow a combination of data collection strategies for a breadth of understanding of teaching-learning environments in a School of

Nursing and Midwifery (Ørngreen, 2015; Anderson and Shattuck, 2012). By means of DBR key characteristics, including micro-phases, different participant groups, expert groups, and being flexibly adaptive (Ørngreen, 2015; Kennedy-Clark, 2013), the study design compartmentalises its ideas into small sets of testable variables through hypotheses for its reliability and validity checks in mixed-methods research design.

4.2. Micro-Phases in DBR Approach and Case Study Using Mixed-methods

The overall method is a case study design with a (sequential and exploratory) mixed-methods approach. It is a case study of one School of Nursing and Midwifery in the context of Scotland and one SAF type (i.e. OSCE assessment feedback). To prevent its mixed-methods design from diverging into two isolated studies (Yin, 2006); the categorical findings with variables (i.e. three motives and eleven goals) in the pre-intervention test conditions are integrated into semi-structured student and lecturer interviews in post-intervention test conditions. The sequence of the DBR approach and methods are listed in Table 4.9.

DBR approach as methodology and methods				
Overall Method	**DBR Approach**	**Study Questions**	**Methods**	**Analysis**
Case Study (sequential & exploratory) Mixed-method Research Design	Preliminary research phase: **Pre-intervention test stage**	SRQ1	Literature reviews.	Integrative reviews.
			Pre-intervention (School-wide) Survey to understand the School SAF culture.	Cronbach's Alpha. One-Way ANOVA & Post-Hoc test. Independent Samples t-test.
			Review of School SAF policies/procedures.	Rules, DoL, Community elements in "Assessment Charter".
			Pre-intervention Test Survey (willingness to use).	Descriptive data analysis in intervention group.
	Prototyping phase: **Post-intervention test stage**	SRQ2	Analysis of SAF system data in test group.	Numbers of collecting their SAF. Length of each SAF with audio & video artefacts.
			Individual (semi-structured) student interviews.	Qualitative content analysis approach.
		SRQ3	Individual (semi-structured) lecturer interviews.	Qualitative content analysis approach.

Table 4.9: DBR approach as methodology and methods

Regarding its epistemological/ontological position, this study adopts pragmatism with mixed methods study design that is fluctuating between positivism and interpretivism.

As a mathematician, my initial ontological position was around positivism to make sense of SAF activities through essential details available in the data categories by means of survey methods for its statistically significances. However, although their results have demonstrated their statistical rankings in relation to the goals, it did not inform me about its actual reasons (i.e. all audio artefact related goals were consistently the least preferred options in the School but it was not clear to me why). Therefore, during the post-intervention stage, my ontological position was transformed from positivism into pragmatism by focusing on the practical inspection of data to both understand and explore relevant learning experiences of nursing students in SAF activities and different MMAs in the School through student and lecturers interviews.

The pre-intervention surveys through its quantitative analysis tend to a positivism position for its generalisations, reliability, and correlations in SAF activities with the use of different MMAs. Following its actual use in OSCE feedback activity, the study employs a qualitative research method in a mixed method design and uses an interpretivism position for more in-dept/rich data analysis and validity through student and lecturer interviews in the School.

4.3. DBR Design Mapping

The quasi-experimental design includes a pre-intervention test survey for all (test and control) nursing students in both first-year undergraduate and first-year postgraduate groups in the School. Following the intervention, individual (semi-structured) student interviews are conducted (Tables 4.10 and 4.11). During these student interviews, I will apply a content analysis method led by the eleven goals in the study. Finally, one lecturer in undergraduate and another in postgraduate studies within the test groups will be invited to individual (semi-structured) interviews. From the lecturer interviews, I will apply a content analysis method led by three elements borrowed from CHAT theory: Rules, Community, and DoL.

Intervention	**School's SAF Culture Analysis**	**Pre-intervention Test**	**Intervention in Test Groups (MMAs in OSCE)**	**Post-intervention Test**	
Timeline	School-wide student survey, December 2017 (Four weeks)	Pre-test student survey, January 2018 (Two weeks)	Mid-January 2018	Student interviews, February–April 2018	Lecturer interviews, May 2018
Context	All SAF activities with MMAs-understanding the School culture	All SAF activities- Readiness for intervention	OSCE assessment	OSCE feedback	OSCE feedback
MMAs: **Online-written** **Audio** **Video**	All undergraduate and postgraduate students in School (n=800).	First-year undergraduate students, (n=296). First-year Postgraduate students (n=37).	First-year undergraduate students, (NU14XX-Honours, n=38). First-year Postgraduate students, (NUM0XX-Shetland, n=10).	Seven first-year undergraduate students (NU14XX-Honours), test group. One first-year undergraduate student (NU14XX), control group. Three first-year Postgraduate students, (NUM0XX-Shetland), test group.	One first-year undergraduate level lecturer, NU14XX-Honours. One first-year postgraduate level lecturer, NUM0XX-Shetland.

Table 4.10: DBR diagram of the interventions

Student participants

The male student population (8%) in nursing studies is currently much lower than female students (92%) in Scotland (CNO Commission, 2017). A similar ratio exists within the School too. Hence, a low response rate of male students can become a weakness in understanding any gender-related categorical findings in the study. Yet, despite all my attempts, no male students did volunteer to participate in these interviews. This means that my findings are indicative of the majority student gender enrolled in nursing studies - female. Due to the end of semester assessment timetables, risk of low participation rate in online surveys was a concern. Although initially offering incentive to students was proposed, the idea was rejected by the School ethics committee.

4.4. The Design in Context: My Position, Students' MMA Use

Although its (sequential and exploratory) mixed-methods approach includes application of multiple quantitative and qualitative research methods, an analysis of a single case study can still have external validity or generalisability issues for the actual use of different MMAs in OSCE feedback, relating to qualitative research methods (Willis, 2014). For example, my earlier explanatory research approach tends towards more quantitative and deductive approach with its two surveys for understanding most-likely, least-likely, and crucial cases of SAF activities with different MMAs in the School. The latter

sequential qualitative method for actual use of MMAs in OSCE feedback has an interpretive basis for reasons and indepth understandings of three motives and eleven goals.

As the online-written artefact in SAF activities is currently mandatory in the School, some student groups are likely to have already experienced the online-written artefact in other academic modules. However, there are currently no students who have received SAF with audio or video artefacts amongst intervention groups. For the same reason, exploring teaching experiences of lecturers for audio or video artefacts in SAF becomes a new activity. Moreover, working as e-learning adviser in the School, I was responsible for editing and distributing these SAF multimedia files during the interventions. To some extent, such involvement with its operations can become a subjective position of the researcher (Dwyer and Buckle, 2009). However, closeness to its operations allowed me to observe these operations and relate these findings to the semi-structured interviews through flexibly adaptive design in DBR.

Some other issues of access are reflected on under the ethical considerations section in the study.

4.4.1. SAF Culture with Its Rules, DoL and School Community

The School's Assessment Charter (2018) provides lecturers and students a common understanding of relevant SAF principles and

procedures. It differs from the University's assessment policy/procedures, including mandatory online management of summative assessments. While the Charter sets out what the students can expect of lecturers and to identify best use of their assessment feedback in the School, it also states what the lecturers should expect of students. Hence, analysing the Charter document through its rules, DoL and community actions provides an understanding of its SAF cultural-localism (Bligh and Flood, 2017).

4.5. Quasi-Experimental Design: Pre/Post-Intervention Tests in Mixed-methods

Prior to attending the OSCE (i.e. pre-intervention test stage), these intervention groups receive a pre-intervention test survey (called willingness to use) to better understand their perceptions (i.e. familiarity, previous experiences and willingness to use).

During the interventions, the test groups will receive their OSCE feedback with all three MMAs formats at the same time.

For the post-intervention test student interviews, two groups are selected, i.e. a first-year undergraduate degree cohort (NU14XX-Honours, N=38) and first-year postgraduate degree cohort (NUM0XX-Shetland, N=10). All other students in NU14XX (n=258) and NUM0XX (n=27) modules are part of the control group. As the test groups were already divided into these cohorts in the School, any randomisation amongst its test participants within the same cohort were not possible.

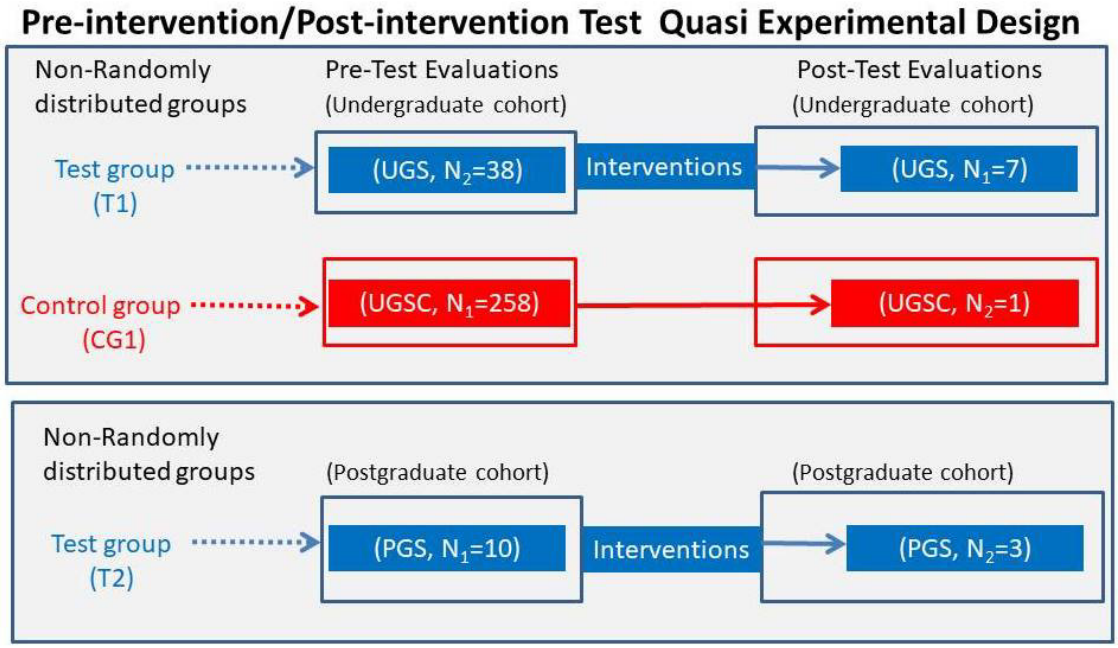


Table 4.11: Pre-intervention/Post-intervention test quasi-experimental design

In the post-intervention test conditions, the individual interviews in test groups include seven undergraduate students in NU14XX-Honours and three postgraduate students in NUM0XX-Shetland cohort as well as one undergraduate student in NU14XX module in the (untreated) control groups. Additionally, to measure intervention conditions by online SAF system data, the secondary data findings (e.g. student numbers collecting their SAF in the test groups over a month period and average length of SAF with audio and video recordings) are used. Finally, two individual lecturer interviews are conducted (one in NU14XX-Honours and another in NUM0XX-Shetland cohort).

In essence, conducting the study with a range of participant groups, i.e. student and lecturer interviews from both undergraduate and postgraduate groups, is central to this study for accessing a range

of different teaching-learning experiences in the School. Similarly, Evans's (2013) literature review identifies a research gap in addressing online assessment feedback from both undergraduate and postgraduate student perspectives as well as few studies considering both lecturer and student perspectives in HE. Nonetheless, choice of individual interviews rather than focus groups is a necessity in this study, due to the students' placement periods for two months in the NHS following to their OSCE. Thus, the individual interview method allows me to match the data collection with nursing students' availability whilst on their placements.

4.6. Analysing School SAF Culture through Students' Experiences and OSO

The School-wide survey (Appendix 1) consists of three main parts:

- Demographic elements
- 33 sub-questions relating to eleven goals
- 3 performance sub-questions (Q13, Q14, Q15) relating to OSO (Table 4.12)
- Comment box

Goals & OSO Indicators	Question number
Familiarity	(Q7), (Q8), (Q9)
Usefulness	(Q10), (Q11), (Q12)
Clarity	(Q17), (Q26), (Q35)
Easier to remember	(Q19), (Q28), (Q37)
Faster to learn	(Q18), (Q27), (Q36)
Paying more attention	(Q21), (Q30), (Q39)
Ease of access	(Q16), (Q25), (Q34)
Providing more information	(Q20), (Q29), (Q38)
Personalisation	(Q24), (Q33), (Q42)
Professionalism	(Q23), (Q32), (Q41)
Mobile learning	(Q22), (Q31), (Q40)
OSO (Performance sub-questions)	(Q13), (Q14), (Q15)

Table 4.12: Goal and satisfaction indicators

The survey questions include a three-point Likert-scale ranging from 3 meaning "Yes" to 1 meaning "No" and a five-point Likert-scale ranging from 5 meaning "Strongly Agree" to 1 meaning "Strongly Disagree" in their measurements.

4.7. Production of Intervention MMAs

Following the OSCE assessments, the audio and video artefacts were recorded in the Clinical Skills Centre recording studio over a

two-week period in the School. Five undergraduate and two postgraduate degree lecturers were invited to create these SAF recordings on an individual basis. All artefacts were recorded with high quality sound/video recording hardware/software to avoid any accessibility and professionalism concerns, aligning with the University's video production guidelines. Finally, the online-written artefacts were also transferred into the online SAF software.

As all SAF contents are seen as confidential between each student and lecturer(s)/reviewer in the School, I was not given permissions to analyse individual SAF content, except for its access and length in audio and video recordings by the School's ethics committee.

5. METHODS

This chapter presents data collection methods, analysis, validity, and reliability in mixed-methods including its ethical considerations in the study.

The data in surveys are collected by means of the University's secure online survey tool. These links are distributed to the relevant groups by the University email system in the School. Their returns (submitting the survey answers online) are accepted as their written consent in the study (Creswell, 2011).

The purpose, consent forms, voluntary participation, and anonymity rules of the study are made clear to all participants by participant information sheets to comply with Lancaster University's ethical approval process. Then, the data are downloaded into Excel™ documents to be analysed by SPPS (v.21) by the University.

All qualitative data are analysed and coded in appropriate categories and themes using MS Office Word™ documents.

5.1. Data Collection Methods

The data collection methods include pre-intervention survey, pre-intervention test survey, post-intervention test interviews and analysis of the School Assessment Charter.

Pre-intervention Survey:

For the School-wide survey (Appendix 1), invitation emails were sent to all students (n=800) on 4th December 2017. 124 students responded to the survey with a 15.5% participation rate.

Pre-intervention Test Survey:

For the pre-intervention test conditions in intervention groups, another survey is conducted (Table 6.29: Pre-intervention Test Survey). The second survey emails were sent to:

- For first-year undergraduate students in NU14XX (n=296), the participation rate (n=29) is 9.8%.
- For first-year postgraduate students in NUM0XX (n=27), the participation rate (n=10) is 37%.

Therefore, the total participation rate is 12%. Due to its closeness to the OSCE deadline and other end of semester assignments in January, the shorter survey timeline caused a lower participation rate.

Post-intervention Test Interviews:

For the post intervention conditions:

- Individual student interviews took place between 25th February and 24th April 2018.
- Two lecturer interviews were in May 2018.

To measure intervention conditions by online SAF system data, secondary data findings (e.g. average length of SAF with audio and video recordings and student numbers collecting their SAF in the test groups over a month period) are also integrated into lecturer interviews for additional evidences of teaching-learning activities.

Interviews:

Semi-structured interview procedures include a participant information sheet, consent form and interview questions documents. These documents were sent to all potential participants via emails prior to interviews. Participation to these interviews was voluntary. I collected the signed consent forms prior to interviews. These interviews were conducted either on the phone or face-to-face environments. During the interviews, similar questions were asked to each participant, although supplementary questions were also asked as appropriate.

Assessment Charter:

The School's Assessment Charter (2018) is publicly available online in the university website. It outlines what lecturers and students should expect of each other in relation to all assessments through its formal and informal rules. However, Summative Assessment Marking Guidance for Staff (2018) is an internal document. It provides guidelines for lecturers on producing SAF content and using different MMAs. As a researcher, I obtained permissions from the School's ethics committee to utilise these documents for

analysis in this thesis. Both documents have April 2018 version control and last accessed on 7 June 2019. As they are currently used for all SAF activities in the School, these policies and guidelines can allow me to understand the current SAF activities with different MMAs use in the School teaching-learning culture.

5.2 Data Analysis, Validity and Reliability in Mixed-methods

The strategies that were employed for ensuring the validity and reliability in the study are:

Step 1: School-Wide Survey (Quantitative Data)

- **Reliability(Statistical Test)**

Cronbach's Alpha is used as reliability tests for measuring internal consistency in the survey data. Firstly, while Cronbach's Alpha is a common concept to test internal consistency for quantitative data, its acceptable values generally range from 0.70 to 0.95 in educational research (Tavakol and Dennick, 2011). For the School-wide survey, the Cronbach Alpha scores are shown in Table 5.13.

Cronbach Alpha Reliability Test		
Categories:	*Cronbach's Alpha value*	*N of Items (Questions)*
All student experiences questions for all three MMAs in SAF.	0.88	33
All questions for MMAs and all student performance questions combined.	0.89	36
Sub-categories:		
Questions for **online-written** artefact in SAF.	0.82	11
Questions for **audio** artefact in SAF.	0.85	11
Questions for **video** artefact in SAF.	0.91	11

Table 5.13: Cronbach Alpha Reliability Statistics

Hence, all Cronbach Alpha scores conform to the acceptable value range for its internal consistency.

- **(Content) Validity**

During the survey development stage, Delphi method is used to test its content validity in the survey questions through testing its survey questions by four TEL practitioners for expert evaluations. Additionally, the School ethical approval committee reviewed and approved the survey.

Finally, all numerical data and statistical tests are analysed by SPSS (v.21) software to minimise any calculations and human errors.

Their appropriateness, analysis, and accuracy are also checked by a university statistician independently (Larkin, 2010).

Step 2: Quasi-Experimental Design (Pre/Post-Intervention Test)

Step 2.A. Measuring Pre-Intervention Test Conditions

To avoid any internal threats to its validity, the study utilises "untreated control groups with dependent pre-intervention and post-intervention test samples without randomisation" and hence, for comparison, a control group is used (Harris et al., 2006). Although there are no randomisations within NU14XX-Honours and NUM0XX-Shetland cohorts, all test and control groups have similar properties due to studying the same modules (i.e. NU14XX and NUM0XX) with similar goals in the School. Therefore, the experiment conditions are likely to create the differences between the test and control groups (Harris et al., 2006).

- **(Content) Validity**

For the second survey in the study to collect pre-intervention test data in the intervention groups, the same Delphi method strategy was used for testing its content validity. As the second survey aims to understand better the pre-intervention test conditions amongst intervention groups with a shorter survey, the results are provided in a descriptive statistical format.

Regarding its internal validity, the students' history of receiving SAF with online-written format in other modules is recognised in the study.

Step 2.B. Post-Intervention Test Evaluation

Through its mixed-method design, the findings in the surveys are integrated into semi-structured student and lecturer interviews. Thus, themes in the individual interviews mirror those in the surveys.

To explore the post-test conditions, a content analysis approach is used to interpret the qualitative data in the (semi-structured) individual student and lecturer interviews. By comparing keywords, content, categories and themes to interpret the underlying context through a summative content analysis method (Erlingsson and Brysiewicz, 2017), I aim to code, group the common findings in data sets, and categorise these textual descriptions using thematic units under eleven goals in the study.

Aligning with Erlingsson and Brysiewicz's (2017) study, the content analysis procedures are:

"*Transcribed interviews are recorded in Word™ documents for systematically transforming them into organised and concise summary of key results. Then, identifying meaning units, condensing, coding the condensed meaning units, and formation of categories and themes are used".*

There are several reasons for me to choose the content analysis method over other methods in the study. Firstly, content and thematic analyses are suitable for a lower level of interpretation in qualitative analysis than grounded theory or hermeneutic phenomenology requiring a higher level of interactions and interpretive complexity (Vaismoradi et al., 2013). Besides, despite being a descriptive method and relying on its content availability (Vitouladiti, 2014), the content analysis is more suitable for categorising the common findings in data sets than thematic analysis (Vaismoradi et al., 2013). Finally, I conducted several pilot research projects using a content analysis method before in the University. Therefore, based on my familiarity with the method as a novice researcher, I propose that this method can provide the relevant findings to discuss the research questions in the study.

During the interviews, the interview notes were read back to participants at the end of each session for any discrepancies to confirm its validity (Bain, 2015).

5.3. Ethical Considerations

The study complies with ethical standards approved by Lancaster University. It was also approved by the School's Research Ethics Committee (SERP) (where the intervention took place).

The intervention was an officially adopted strategy of the School as partially sponsoring body. The initial study design approved by

Lancaster University was around accessing larger cohorts of students and various SAF activities. However, during its ethical approval process in the School, the proposal was asked to be amended to align with the SERP recommendations concerning inevitably higher numbers of negative feedback in larger cohorts during these interventions because video and audio artefacts in SAF activities are new experiences for the School's lecturers and students. I discussed these issues with my thesis supervisor at Lancaster University. We sought further advice and amended the initial study design as we wanted to make sure that there was no pressure and coercion felt.

Some aspects of ethical conduct in the data collection processes included the fact that participations to all surveys and individual interviews were voluntary and without any incentives or penalisation. This was particularly stressed in order to make sure the sense of pressure was minimal. In addition, all students' and lecturers' personal data (e.g. name, ID, or any identifying information) were made confidential. Therefore, such information was anonymised to avoid identification.

As participation to lecturers' interviews were voluntary, two lecturers agreed to participate. While such proactive responsiveness indicates TEL developments to be often driven by enthusiastic lecturers in the School (Newland and Martin, 2016), this equally

implies that these enthusiastic lecturers are catalysts as drivers of TEL practices in the School through their voluntary participation.

6. DATA ANALYSIS OVERVIEW AND FINDINGS

6.1. Introduction

This section consists of a data analysis overview and findings relating to each study research question (SRQ) through:

- **(SRQ1) School-wide survey**: Prior to any intervention, measuring students' perceptions for different MMAs in SAF activities in relation to their learning experiences and OSO through motives and goals
- **(SRQ1) School's Assessment Charter**: Understanding SAF community, rules, and DoL in the School teaching-learning policies
- **(SRQ1) Pre-intervention test survey**: Measurement of students' perceptions in the intervention (test and control) groups
- **(SRQ2.1) SAF system data in post-intervention test groups**: Analysing online access data in OSCE feedback with MMAs amongst the test groups
- **(SRQ2) Student interviews in post-intervention test groups**: Exploring learning experiences of students and their OSO in OSCE feedback with MMAs
- **(SRQ3) Lecturer interviews in post-intervention test group**: Exploring teaching-learning experiences of lecturers in OSCE feedback with MMAs

6.2. School-Wide Survey Results

Understanding all nursing and midwifery students' perceptions in the School for the use of different MMAs in SAF activities will allow

me to draw conclusions to answer the first question through three motives and eleven goals (SRQ1).

6.2.1. Descriptive Data Overview

During the School-wide survey (Appendix 1), 124 students (n=800) responded to the online survey with 15.5% participation rate. An artefact sub-scale indicator category (Table 6.14) provides a descriptive data summary.

Motive	Goal:	Question Number (Q)	Artefact Sub-scale Indicator	Mean ($\bar{X}$)	Stand. Dev. (S)
Effectiveness	Usefulness	(Q10)	Online-written	4.39	0.62
	Faster to learn	(Q36)	Video	4.13	1.01
	Easier to remember	(Q37)	Video	4.07	0.96
	Paying more attention	(Q39)	Video	4.07	0.93
	Clarity	(Q17)	Online-written	4.05	0.74
	Clarity	(Q35)	Video	3.94	0.81
	Easier to remember	(Q19)	Online-written	3.73	0.84
	Usefulness	(Q12)	Video	3.70	0.88
	Faster to learn	(Q18)	Online-written	3.65	0.92
	Faster to learn	(Q27)	Audio	3.64	0.94
	Usefulness	(Q11)	Audio	3.57	0.75
	Paying more attention	(Q21)	Online-written	3.54	0.93
	Easier to remember	(Q28)	Audio	3.48	0.86
	Paying more attention	(Q30)	Audio	3.44	0.80
	Clarity	(Q26)	Audio	3.29	0.94
	***Familiarity	(Q7)	Online-written	2.79	0.57
	***Familiarity	(Q8)	Audio	1.50	0.78
	***Familiarity	(Q9)	Video	1.44	0.77
Efficiency	Ease of access	(Q16)	Online-written	4.39	0.74
	Ease of access	(Q34)	Video	4.12	0.91
	Providing more information	(Q38)	Video	3.97	0.86
	Ease of access	(Q25)	Audio	3.82	0.86
	Providing more information	(Q20)	Online-written	3.70	0.77
	Providing more information	(Q29)	Audio	3.37	0.84
Transformation	Professionalism	(Q23)	Online-written	4.17	0.74
	Mobile learning	(Q22)	Online-written	4.16	0.75
	Mobile learning	(Q40)	Video	4.01	0.92
	Mobile learning	(Q31)	Audio	3.90	0.89
	Personalisation	(Q24)	Online-written	3.85	0.73
	Professionalism	(Q41)	Video	3.71	0.90
	Personalisation	(Q42)	Video	3.67	0.83
	Professionalism	(Q32)	Audio	3.44	0.84
	Personalisation	(Q33)	Audio	3.40	0.96

Table 6.14: Artefact sub-scale indicator category

*** *Familiarity goal with three-point Likert-scales. The others are five-point.*

Therefore, it becomes apparent that the students prefer the use of each MMA in SAF activities for different motives to meet their specific goals in learning experiences in the School. Regarding each goal (five-point Likert scale-rating), a summary of findings in overall descriptive data (Table 6.14) show that:

1. **For the use of online-written in SAF**, while ease of access ($\bar{X}_W$ =4.39) and usefulness ($\bar{X}_W$ =4.39) are the highest scores in their learning experiences; faster to learn ($\bar{X}_W$ =3.65) and paying more attention ($\bar{X}_W$ =3.54) are the lowest.
2. **For the video in SAF,** while faster to learn ($\bar{X}_V$ =4.13) and ease of access ($\bar{X}_V$ = 4.12) are the highest scores, usefulness ($\bar{X}_V$ =3.70) and personalisation ($\bar{X}_V$ =3.67) are the lowest.
3. **For the audio in SAF**, while mobile learning ($\bar{X}_A$ =3.90) and ease of access ($\bar{X}_A$ =3.82) are the highest scores; providing more information ($\bar{X}_A$ =3.37) and clarity ($\bar{X}_A$ =3.29) are the lowest.
4. Although ease of access ($\bar{X}_W$ =4.39) and usefulness ($\bar{X}_W$ =4.39) **with online-written artefacts** are the highest scoring goals in learning experiences; providing more

information ($\bar{X}_A$ =3.37) and clarity ($\bar{X}_A$ =3.29) **with the audio** are the lowest.

In addition, regarding the highest scores under each motive:

1. Effectiveness motive:
    a. **Online-written artefact** is usefulness ($\bar{X}_W$ =4.39) and clarity ($\bar{X}_W$ =4.05).
    b. **Video artefact** is faster to learn ($\bar{X}_V$ =4.13), easier to remember ($\bar{X}_V$ =4.07) and paying more attention ($\bar{X}_V$ =4.07).
2. Efficiency motive:
    a. **Online-written artefact** is ease of access ($\bar{X}_W$ =4.39).
    b. **Video artefact** is providing more information ($\bar{X}_V$ =3.97).
3. Transformation motive:
    a. **Online-written artefact** is professionalism ($\bar{X}_W$ = 4.17), mobile learning ($\bar{X}_W$ =4.16) and personalisation ($\bar{X}_W$ =3.85).

6.2.1.1. Conclusions in Descriptive Data Summary

A further analysis of factors in students' learning experience and OSO (five-point Likert scale-rating) (Table 6.14) demonstrates that:

1. While ease of access ($\bar{X}_W$ =4.39), usefulness ($\bar{X}_W$ =4.39), professionalism ($\bar{X}_W$ =4.17), and mobile learning ($\bar{X}_W$ =4.16)

goals are the most popular **online-written artefact** choices; the faster to learn ($\bar{X}_V$ =4.13), ease of access ($\bar{X}_V$ =4.12), easier to remember ($\bar{X}_V$ =4.07) and paying more attention ($\bar{X}_V$ =4.07) goals are the most popular **video** choices. However, the clarity ($\bar{X}_W$ =4.05) and personalisation ($\bar{X}_W$ =3.85) with **online-written artefact** are lower than these goals.

2. The students are the least familiar with the **video in SAF** ($\bar{X}_V$ =1.44). However, they suggest it is faster to learn ($\bar{X}_V$ =4.13), easier to remember ($\bar{X}_V$ =4.07), paying more attention ($\bar{X}_V$ =4.07) and providing more information ($\bar{X}_V$ =3.97) than any other MMAs.
3. Although they are more familiar with the use of audio ($\bar{X}_A$ =1.50) than video ($\bar{X}_V$ =1.47), **the audio artefact in SAF** has consistently ranked the lowest amongst all goals.
4. **Personalisation** goal with **video** and **audio** artefacts are amongst the least popular choices in the School. Particularly, personalisation with **video** in SAF activities has the lowest ranking amongst all other video choices.

In essence, the use of audio artefacts in SAF has consistently become the least preferred choice under all motives and goals in this study, contradicting the findings of Hayman (2018), Broadbent et al. (2018), Pearson (2018), Zimbardi et al. (2017), Nemec and

Dintzner (2016), Westwater-Wood and Moore (2016), Harrison et al. (2015), McCarthy (2015), Carruthers et al. (2015) Cann (2014), Voelkel and Mello (2014), Chew (2014), and Lunt and Curran (2010).

Finally, the factors affecting students' OSO are from three performance related questions (i.e. Q13, Q14, Q15) for the use of each MMA in the survey. Their findings are excluded from "Artefact Sub-scale Indicator Category Table" (Table 6.14). Subsequently, an analysis of their mean ($\bar{X}$) value shows that there are more students suggesting the online-written in SAF ($\bar{X}_{WP}$=4.12, S_W=0.66) to improve their performances than video ($\bar{X}_{VP}$=3.83, S_V=0.94) and audio ($\bar{X}_{AP}$=3.73, S_A=0.80) artefacts.

6.2.2. Technology-Enhanced Management of Education: Demographic Data Overview and Conclusions

Understanding SAF with different MMAs requires an investigation of relationship between student characteristics and learning experience (Kim and Moore, 2005). The findings (Table 6.15) relate to all students in the School under pre-intervention test conditions through the School-wide survey.

Variable	Frequency	Percent (%)	Variables	Frequency	Percent (%)
Q1. Age			**Q4.Level of Study**		
16-17	10	8.1	Undergraduate first-year	64	51.6
18-22	52	41.9	Undergraduate second-year	25	20.2
23-27	28	22.6	Undergraduate third-year	23	18.5
28-32	11	8.9	Honours	1	0.8
33-37	6	4.8	Postgraduate	11	8.9
38-42	11	8.9	Total	124	100
43-47	1	0.8	**Q5. Mode of Study**		
Over 48	5	4.0	On-campus	68	54.8
Total	124	100	Blended learning	53	42.7
Q2. Gender			Online-learning	3	2.4
Female	117	94.4	Total	124	100
Male	7	5.6	**Q6. ESOL**		
Total	124	100	Yes	115	92.7
Q3. Subject of Study			No	9	7.3
Nursing	100	80.6	Total	124	100
Midwifery	24	19.4			
Total	124	100			

Table 6.15: Demographic data analysis

The artefact sub-scale indicator category (Table 6.14) and students' demographic data are used to understand the interactions for the use of different MMAs in SAF activities.

6.2.2.1. Age Related Conclusions

Measurement of student experiences between different age groups for the use of different MMAs in SAF activities are shown in Table 6.16.

Artefact Sub-scale Indicator (n=124)	p value for Levene Statistic	p value for ANOVA test
Online-written	0,253*	0.139
Audio	0,881*	0.553
Video	0,682*	0.074
Test:	*p>0.050 are homogenous	*p<0.050 statistically significant

Table 6.16: ANOVA test results for age

Levene Statistic results show that all p values are bigger than 0.05. Therefore, all groups are homogenous. Then, ANOVA test is conducted. As all p values are bigger than 0.05, the ANOVA test results show no statistically significant differences in students' perceptions between different age groups for the online-written, audio, and video artefacts in SAF activities.

Hence, it is concluded that there are no differences between different age groups in their experiences for the use of different MMAs in SAF in the School.

Finally, this result aligns with the literature review findings that the use of different MMAs in SAF between different age groups in the School is not a significant predictor of changing student experiences (Sopina and McNeill, 2015; Harrison et al., 2015; Henderson and Phillips, 2014; Marriott and Teoh, 2012).

6.2.2.2. Gender Related Conclusions

Less than 10% of nursing students in Scotland are male and their numbers are even less in midwifery studies (Jones-Berry, 2018). There is a similar proportion for the gender category in the School. Amongst the participants, there are only 7 male nursing students compared to 117 females and no participant selected the 'Unspecified' option.

An Independent Sample T-Test is conducted between female and male categories (Table 6.17).

Artefact Sub-scale Indicator (n=124)	t value	df	Sig. (2-tailed) (p)
Online-written	-0,812	6,285	0.447
Audio	-2,266	122	0.025*
Video	-3,610	8,187	0.007*
*p<0.050 statistically significant			

Table 6.17: Independent Samples T-Test results for gender

T-Test results show that although there are no statistically significant differences between different gender groups in their

experiences for the use of online-written artefacts in SAF activities, there are differences for audio and video artefacts as a significant predictor.

Hence, it is concluded that:

- There are statistically significant differences in students' experiences for the audio artefact in SAF activities between male ($\bar{X}_M$ =4.01, S_M=0.72) and female ($\bar{X}_F$ =3.50, S_F=0.56) students. Male students would prefer the use of audio artefacts in SAF more than female students in the School.
- There are statistically significant differences in students' experiences for the video artefact in SAF activities between male ($\bar{X}_M$ =4.52, S_M =0.42) and female ($\bar{X}_F$ =3.90, S_F=0.71) students. Male students would prefer the use of video artefacts in SAF activities more than female students in the School (McCarthy, 2015).

6.2.2.3. Subjects of Study Related Conclusions

Independent Sample T-Tests show no statistical significance between different subjects of study groups (i.e. nursing and midwifery) in their experiences for the use of different MMAs in SAF activities in the School (Table 6.18).

Artefact Sub-scale Indicator (n=124)	t value	df	Sig. (2-tailed) (p)
Online-written	0,455	122	0,650
Audio	0,515	122	0,607
Video	1,203	30,163	0,238
*p<0.050 statistically significant			

Table 6.18: Independent Samples T-Test for subjects of study

This finding is crucial in the study because the post-test interviews are conducted only amongst nursing student groups in the School.

Hence, in conclusion, any student experiences for the use of different MMAs amongst nursing students are similar to the midwifery students in the School.

6.2.2.4. Level of Study Related Conclusions

Measurement between different levels of study groups (i.e. first, second, third-year, honours, and post-graduate) are shown in Table 6.19.

Artefact Sub-scale Indicator (n=124)	p value for Levene Statistic	p value for ANOVA test
Online-written	0,189*	0,946
Audio	0,533*	0,028*
Video	0,067*	0,158
Test:	*p>0.050 are homogenous	*p<0.050 statistically significant

Table 6.19: ANOVA test results for level of study

The Levene test shows that all groups are homogenous. Then, ANOVA test results show no statistically significant differences between different levels of study in their experiences for the online-written and video artefacts in SAF activities. However, there are statistically significant differences for the audio artefact in SAF between first-year ($\overline{X}_{1st}$ =3.68, S_{1st}=0.54) and second-year ($\overline{X}_{2nd}$ =3.31, S_{2nd}=0.61) students.

Post-Hoc comparisons using the Tukey HSD Test proves their differences (Table 6.20).

(I) Q4.Level of Study	**(J) Q4.Level of Study**	**Mean Difference (I-J)**	**p value**
Undergraduate first-year students	Undergraduate second-year students	0,369*	0,035*
	Undergraduate third-year	0,210	0,417
	Postgraduate	0,353	0,233
*p<0.050 statistically significant			

Table 6.20: Post-Hoc test results about audio for levels of study

Notably, there was only one person belonging to the honours-degree group in the survey. To find any meaningful statistical differences, this student was included in the third-year student group.

Hence, it is concluded that first-year undergraduate degree students prefer the use of audio artefacts in SAF more than second-year undergraduate degree students in the School. However, there are no statistically significant differences between different levels of study in their experiences for the use of online-written and video artefacts in SAF.

This finding is also crucial in the study because the post-test interviews are conducted only amongst first-year undergraduate and first-year postgraduate degree nursing student groups in the School. Hence, the use of audio artefacts in SAF amongst second-year undergraduate degree students will be less popular than first-year undergraduate students.

6.2.2.5. Modes of Study Related Conclusions

Measurement results between different modes of study groups (i.e. on-campus, blended, and online-learning) for the different MMAs in SAF activities show that group distributions for audio and video artefacts in SAF activities are homogenous but the online-written artefact is not (Table 6.21).

Artefact Sub-scale Indicator (n=124)	p value for Levene Statistics
Online-written	0,008
Audio	0,856*
Video	0,072*
If *p>0.050 then the group is homogenous	

Table 6.21: Levene Statistics results for mode of study

Therefore, ANOVA Post-Hoc test (Table 6.22) is conducted between different modes of study for the audio and video artefacts.

Dependent Variable	**(I) Q5.Mode of Study**	**(J) Q5.Mode of Study**	**Mean Difference (I-J)**	**p value**
Video	Blended	On-campus	0,30019	0,055
		Online-learning	0,14088	0,939
	Online-learning	On-campus	0,15931	0,922
Audio	On-campus	Blended	0,07603	0,762
	Online-learning	On-campus	0,10196	0,954
		Blended	0,17799	0,867
*p<0.050 statistically significant				

Table 6.22: ANOVA Post-Hoc test results for mode of study

However, all Sig. (p) values are bigger than 0.05. Therefore, their values are not statistically significant.

Hence, there are no statistically significant differences between different modes of study groups in their experiences for the use of online-written, audio, and video artefacts in SAF activities in the School.

6.2.2.6. English Language Choices Related Conclusions

Independent Sample T-Test results (Table 6.23) indicate no statistically significant difference in students' experiences between different language groups (i.e. English as their First Language (EFL), English as Second Language (ESOL)) for the audio and video artefacts in SAF activities.

Artefact Sub-scale Indicator (n=124)	t value	df	Sig. (2-tailed)
Online-written	2,517	122	0,013*
Audio	0,638	8,603	0,540
Video	0,361	122	0,719
*p<0.050 statistically significant			

Table 6.23: Independent Samples T-Test for language

However, there are statistically significant differences between EFL ($\bar{X}_{EFL}$ =3.93, S_{EFL}=0.48) and ESOL ($\bar{X}_{ESL}$ =4.36, S_{ESL}=0.55) students in their experiences for online-written artefact in SAF.

Hence, it is concluded that the ESOL group (n=9) would prefer the use of online-written in SAF more than EFL (n=115) in the School.

6.2.3. Statistically Significant Differences Between Students' Experience and OSO Questions

Firstly, Levene Statistics and then a One-Way ANOVA test are conducted between 'Strongly Agree', 'Agree', 'Undecided', 'Disagree', and 'Strongly Disagree' groups to understand their significant difference relating to experience questions and their OSO (Table 6.14).

A summary of accepted hypothesis statements about their statistically significant differences between the groups' means value are shown in Table 6.24.

MMA	**Motive Indicator**	**Goal Related Hypothesis: Statically Significant Differences Between Student Experience and OSO Questions**
Online-written	Effectiveness	H1: **Faster to learn** has an effect on improving students' performance with the use of **online-written artefact** in SAF.
	Effectiveness	H2: **Easier to remember** has an effect on improving students' performance with **online-written artefact** in SAF.
	Effectiveness	H3: **Paying more attention** has an effect on improving their performance with **online-written artefact** in SAF.
Audio	Effectiveness	H4: **Easier to remember** has an effect on improving their performance with **audio** in SAF.
Video	Effectiveness	H5: **Familiarity** has an effect on improving their performance with **video** artefact in SAF.
	Effectiveness	H6: **Usefulness** has an effect on improving their performance with **video** artefact in SAF.
	Efficiency	H7: **Ease of access** has an effect on improving their performance with **video** artefact in SAF.

	Effectiveness	H8: **Clarity** has an effect on improving their performance with video artefact in SAF.
	Effectiveness	H9: **Faster to learn** has an effect on improving their performance with **video** artefact in SAF.
	Effectiveness	H10: **Easier to remember** has an effect on improving their performance with **video** in SAF.
	Efficiency	H11: **Providing more information** has an effect on improving their performance with **video** in SAF.
	Effectiveness	H12: **Paying more attention** has an effect on improving their performance with **video** in SAF.
	Transformation	H13: **Mobile learning** has an effect on improving their performance with **video** artefact in SAF.
	Transformation	H14: **Professionalism** has an effect on improving their performance with **video** artefact in SAF.
	Transformation	H15: **Personalisation** has an effect on improving their performance with **video** artefact in SAF.

Table 6.24: Accepted hypothesis statements

These eleven goals have an effect on improving students' performance for the use of MMAs in SAF, but the ANOVA test concludes that there are only statistically significant differences between groups about:

- The easier to remember goal for the use of all MMAs
- The faster to learn and paying more attention goals for the use of online-written and video artefacts
- The only the easier to remember goal for the use of the audio artefact

- All goals for the use of video artefacts

In conclusion, it can be statistically predicted that the biggest change of students' experiences and their satisfaction in the School will likely occur with the use of video artefacts in SAF. However, the least change likely to occur is with the use of audio in SAF.

6.2.4. Open-text Comments in School-wide Survey

Overall, there are eleven qualitative comments falling into four goal categories as follows.

6.2.4.1. Familiarity Goal

Under the effectiveness motive, the students are more familiar with online-written in SAF ($\bar{X}_W$ =2.79) than audio ($\bar{X}_A$ =1.50) and video ($\bar{X}_V$ =1.44) artefacts (three-point scale-rating) in the School (Table 6.14). Subsequently, there are more students suggesting the online-written ($\bar{X}_{WP}$ =4.12) in SAF to improve their performance than video ($\bar{X}_{VP}$ =3.83) and audio ($\bar{X}_{AP}$ =3.73) artefacts (five-point scale-rating) (Section 6.2.1). However, their lack of familiarity with different MMAs in SAF is their most common concern. For example:

"*I do not have any experience of audio or video use for feedback, hence my inability to determine their impact*" (Third-year undergraduate student).

Meanwhile, although SAF with online-written and audio artefacts are recognised in the School's Assessment Charter (2018), the video

artefact is not recognised. Similarly, there is no statistically significant difference between the groups about familiarity with online-written and audio artefacts in SAF to improve their performance (Table 6.24). However, the hypothesis for the video artefact is accepted in the ANOVA test (Table 6.25).

Operation	**Differences**
Independent Variable (Goal):	Q9. I am familiar with the use of video artefact in SAF.
Dependent Variable:	Q15. My performance is improved with video artefact in SAF.
H5:	Familiarity has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "No" students groups for being familiar with video in SAF to improve their performance. "Undecided" group suggests that familiarity with video in SAF improves their performance. Mean difference is 0,628.

Table 6.25: H5 Hypothesis, Familiarity and Video Artefact

Hence, although they are less familiar with video in SAF than online-written in the School, there is still a statistically significant difference between "Undecided" and "No" groups for familiarity with video in SAF to improve their performance.

Finally, contradicting Doan's (2013) findings for students being very receptive to all assessment feedback processes, one student points out their lack of familiarity with MMAs in the School:

"*I'm assuming text feedback has to do with when you can click on your written submission to see comments, but I didn't even find*

that until after the second time I submitted assignment recently, only because I received such a low grade and tried to find out why. I've never seen any way to access audio or video feedback or don't know if there is any" (Second-year undergraduate degree).

Similarly, lecturers equally feel disappointed with inadequate student engagement and responsiveness to SAF, despite providing large amounts of crucial SAF (West and Turner, 2016). Besides, the online SAF system in the School delivering final grades to students before receiving SAF is a major weakness in its current pedagogic design (Cann, 2014). Therefore, it is evident that some students do not access their SAF with MMAs, due to their lack of familiarity in the School.

6.2.4.2. Usefulness Goal

Under the effectiveness motive, the students consider the online-written artefacts in SAF ($\bar{X}_W$ =4.39) to be much more useful in their experiences than video ($\bar{X}_V$ =3.70) and audio ($\bar{X}_A$ =3.57) in the School (Table 6.14). Two indicative student comments identify their contradictory views on the use of each MMA in SAF within the usefulness goal. The first comment aligns with the survey's categorical findings about online-written format in SAF being their most popular choice as:

"*I think using online feedback is a good way for everyone to gain their results, but the use of audio or video should be optional as not*

everyone would find this the best way to retain or digest information given to them" (Second-year undergraduate student).

In fact, the second, third and final year students are more familiar with online-written artefacts in SAF activities than the first year student groups. Such a high popularity can be associated with their current familiarity with online-written artefacts in the School and the School Assessment Charter (2018) procedures about mandatory use of the online-written artefact. On the contrary, although annotations in online-written artefacts in SAF are useful for referring to new resources directly (Sopina and McNeill, 2015), Watkins et al. (2014) highlight that only more than half are satisfied with annotated feedback for being constructive, easy to understand and sufficient quantity to be meaningful in nursing studies. Besides, annotated feedback has a risk of restricting feedback and student engagement by being limited to the margins of essays and rubrics (Phillips et. al, 2016).

The second indicative student comment recognises various benefits of each MMA in SAF as: *"I think a range of feedback would be good"* (Third-year undergraduate student).

Similarly, SAF with different MMAs can become more useful and satisfying for students, but their use alone does not necessarily ensure higher OSO due to the risk of wider cultural factors negatively affecting students' learning experiences (Phillips et al.,

2016; Broadbent et al., 2018). Therefore, the lecturers' perspectives in the School community will be considered in this study.

Meanwhile, although there are no statistically significant differences between the groups regarding the usefulness goal with online-written and audio artefacts in SAF to improve their performance, there are differences for video in the ANOVA test (Table 6.26).

Operation	**Differences**
Independent Variable (Goal):	Q12. Usefulness
Dependent Variable:	Q15. My performance is improved with the use of video artefact in SAF.
H6:	Usefulness has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for usefulness with video in SAF to improve their performance. "Undecided" group suggests that usefulness with video in SAF improves their performance. Mean difference is 1,930.
2nd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for usefulness with video in SAF to improve their performance. "Strongly Agree" group suggests that usefulness with video in SAF improves their performance. Mean difference is 1,520.

Table 6.26: H6 Hypothesis, Usefulness and Video Artefact

6.2.4.3. Ease of Access Goal

Under the efficiency motive, the students find online-written artefacts in SAF ($\bar{X}_W$ =4.39) easier to access than video ($\bar{X}_V$ =4.12)

and audio ($\bar{X}_A$=3.82) in the School (Table 6.14). These findings are supported by the following student comments as:

"I'm not convinced by audio and video recordings for feedback. I like to have the notes printed to go back to for future essays" (Postgraduate student).

Many students still prefer online-written artefacts in SAF through ease of access because SAF is stored alongside learning materials and this enables them to refer to SAF easily for reviews and revisions (TELED, 2016; Rebecca and Tannous, 2015). Similarly, although there are no significant differences for audio and video artefacts in SAF between ESOL students (Section 6.2.2.F), the ESOL group still prefer the online-written artefact more than EFL in the School. However, while some students have a requirement of storing hard-copy versions of the online-written artefact, any attempt on generalising such a comment should be done cautiously. For example, there are no changes in student OSO for hard-copy and online-written artefacts in SAF contexts (Sopina and McNeil, 2015). Besides, the hard-copy artefact in SAF can become confusing for students with disabilities as some find higher amounts of written text demoralising in SAF for essay types of assignment (Sherman and Pullen, 2017).

Finally, the ANOVA test concludes that only the video artefact related hypothesis (H7) is accepted regarding this goal (Table 6.27).

Operation	**Differences**
Independent Variable (Goal):	Q34. Ease of access
Dependent Variable:	Q15. My performance is improved with the use of video artefact in SAF.
H7:	Ease of access has an effect on improving their performance with the use of video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for ease of access with video in SAF to improve their performance. "Undecided" group suggests that ease of access with video in SAF improves their performance. Mean difference is 0,628.
2nd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for ease of access with video in SAF to improve their performance. "Strongly Agree" group suggests that ease of access with video in SAF improves their performance. Mean difference is 2,520.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for ease of access with video in SAF to improve their performance. "Strongly Agree" group suggests that ease of access with video in SAF improves their performance. Mean difference is 1,002.
4th difference:	There are statistically significant differences between "Strongly Agree" and "Agree" groups for ease of access with video in SAF to improve their performance. "Strongly Agree" group suggests that ease of access with video in SAF improves their performance. Mean difference is 0,652.

Table 6.27: H7 Hypothesis, Ease of Access and Video Artefact

Thus, although the students find the video artefact in SAF ($\bar{X}_v$ =4.12) easier to access than audio in the School, there are still statistically significant differences between them for ease of access with the video artefact to improve their performance.

6.2.4.4. Providing More Information Goal

Under the efficiency motive, the video artefact in SAF ($\bar{X}_V$ =3.97) provides more information than online-written ($\bar{X}_W$ =3.70) and audio ($\bar{X}_A$ =3.37) in the School (Table 6.14). This is because the video artefact in SAF can be more personal, supportive, clearer, and prompt reflection through body language and hand gestures to aid verbal communication (Henderson and Phillips, 2014; Marriott and Teoh, 2012). The following student comment is indicative of this:

"Super idea. Video would allow the student to understand the non-verbal communication" (Third-year undergraduate student).

Finally, the ANOVA test concludes that only the video artefact related hypothesis (H11) is accepted regarding this goal (Table 6.28).

Operation	**Differences**
Independent Variable (Goal):	Q38. Providing more information.
Dependent Variable:	Q15. My performance is improved with the use of video artefact in SAF.
H11:	Providing more information has an effect on improving their performance with the use of video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for providing more information with video in SAF to improve their performance. "Undecided" group suggests that providing more information with video in SAF improves their performance. Mean difference is 1,500.
2nd difference:	There are statistically significant differences between "Agree" and "Disagree" groups for providing more information with video in SAF to improve their performance. "Agree" group suggests that providing more information with video in SAF improves their performance. Mean difference is 1,593.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for providing more information with video in SAF to improve their performance. "Strongly Agree" group suggests that providing more information with video in SAF improves their performance. Mean difference is 2,149.
4th difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for providing more information with video in SAF to improve their performance. "Strongly Agree" group suggests that providing more information with video in SAF improves their performance. Mean difference is 0,649.

Table 6.28: H11 Hypothesis, Providing More Information and Video Artefact

Hence, although the students find the video artefact in SAF ($\overline{x}_v$ =3.97) provides more information than any other MMA in the School, there are still statistically significant differences between

them for providing more information to improve their performance with the use of video.

6.3. The School's Assessment Charter Overview and Findings

6.3.1. School SAF Community

There are tensions between the University's institutional policies and the School's own SAF policies in its nursing and midwifery education community; so-called cultural-localism in HE (Bligh and Flood, 2017). For example, while the University's Assessment Policy (2015) sets out standards for a common understanding of SAF activities with MMAs, the Charter (2018) focuses on SAF activities with MMAs in its local community. Yet, all online management of SAF activities are currently mandatory in the School in contrast to the University, suggesting online SAF is supported more at the School level than the institutional level (Newland and Martin, 2016).

Meanwhile, despite not being explicitly recognised in the Charter, the University's choice of SAF software tool in its VLE leads to all SAF developments with MMAs by its design rules and tool selections in the School community, such as engagement with the SAF software design to learn from its contextualisation, pedagogic adaptations, functions, accessibility, layout, and its delivery method (Rae and Cochrane, 2008). All students in the School receive e-learning inductions for using the online SAF system in each academic year but many can still find the online SAF system (GradeMark™) difficult to use despite receiving additional support materials (Cann, 2014; Rebecca and Tannous, 2015). Furthermore,

"GradeMark™" being rebranded recently to "Feedback Studio™" shows continuously changing terminologies and additional training needs for its new layout and functions within the updated versions in the School. Nevertheless, although the software allows recording a maximum of three minutes audio feedback, the download option of digital assignments excludes the audio files in SAF for students. Besides, its audio recording function does not include any editing capabilities for SAF amendments, the only option being deleting and re-recording. Yet, it does not allow recording video artefact in SAF. As a result of these software inefficiencies, lecturers in the School community are avoiding the use of different MMAs in SAF. Finally, while the SAF system can record only up to 30 seconds of student access into the online-written artefact, any further student activities, such as length, time, visited links, or any downloads, cannot be recorded as learning analytics in the School. Yet, lack of such meaningful learning analytics in the system is hindering lecturers from understanding SAF teaching-learning activities in the School.

To describe SAF borders in OSCE feedback activity in the local community, the School's Assessment Charter (2018) suggests that:

"*Written feedback will be Word processed. Where this is not possible, hand written feedback will be legible and in pen, for example OSCE feedback*".

Regarding OSCE feedback as online-written artefacts, all hard-copy notes are transferred into digital format under the experiment conditions in the study.

6.3.2. SAF Rules in School Community

The School's SAF policies outline not only how SAF with MMAs are created but also what SAF contents should be in the School. The Charter (2018) and Summative Assessment Marking Guidance for Staff (2018) documents include both formal (i.e. procedures, referencing style, plagiarism check, word counts, rubric, grammar and academic writing style) and informal rules (i.e. lecturers expectations). While these rules highlight how SAF activities are structured, they also highlight its pedagogic approach between summative assessments 'feedback' and 'feedforward' concepts (Ferrell and Gray, 2016). For example, the SAF pedagogic rules are:

"*Feedback is phrased constructively to indicate strengths of work and areas for development. Feedforward doesn't mean that answers will always be provided, but student may be directed to other resources or questions are posed to help students' progress their analysis/thinking*" (Assessment Charter, 2018).

Besides, these SAF policies do not determine any volume of SAF activities in the School.

As a formal rule, standard timing of SAF release is four weeks in the School. "*While online-written feedback focus on various aspects of*

module assessment including assessment content, majority of SAF is in the form of annotations on the student submissions" (Summative Assessment Marking Guidance for Staff, 2018). Therefore, currently, the use of online-written artefact dominates SAF content with these formal design rules (i.e. pre-written comments structures with mandatory rubrics) and informal rules about lecturers' free-text comments (i.e. clarity of expressions). Furthermore, the SAF rules include mandatory inclusion of module descriptor, module handbook, SAF guidelines, and assessment grids in the School. Hence, from the lecturers' perspective, assessing learning outcomes and consistent marking are two main rules for producing SAF activities. Meanwhile, SAF marking penalties for students (e.g. incorrect file type, excess wordage, plagiarism and late submission) are other formal rules in the School. Lastly, according to the University's Assessment Policy and Procedures rules (2015), the students must be informed when to expect their SAF or if there are any delays.

As an informal rule, those students who fail in the assessment are expected to reflect on the full SAF and access available support services, including study skills, disability services, and library resources in the community (Assessment Charter, 2018).

6.3.3. Division of Labour (DoL)

DoL for lecturers in SAF activity includes:

"*Summative assessment is marked by a lecturer, moderated by another, reviewed by external examiner in another institution and ratified by assessment board in the School"* (Assessment Charter, 2018).

In this study, DoL for lecturers also include creating the OSCE feedback with different online-written, audio and video artefacts under intervention conditions. While these developments also require editing these multimedia files and distributing them into the relevant student accounts in the online SAF system, I was involved in the operation of editing multimedia files through its DoL.

Furthermore, there are no formal rules for students collecting or acting upon their SAF in the School. Hence, these informal rules (suggesting being receptive to SAF) become an (expected) action through DoL in SAF activities. For example, while the DoL for lecturers are highlighted as "*Developing assessments, marking and providing detailed feedback take an extensive amount of time*" (Assessment Charter, 2018), its DoL for the students are "*Feedback is provided to help students develop and, therefore, it is appropriate for lecturers to expect the feedback to be used and acted upon*" in the School.

Nonetheless, despite such specific expectations of lecturers for access, engagement and responsiveness to the SAF (West and Turner, 2016; Gedye, 2010), some students can still ignore their

SAF with MMAs by "*only accessing the SAF recently after receiving a low grade*" (second-year undergraduate student, School-wide survey). This indicates a lack of teaching-learning cultural developments in SAF activities in the School.

Finally, for DoL in the SAF activities, the University operates all online SAF systems within the VLE and provides technical support in the community.

6.3.4. Conclusions on SAF Policies through Tensions

The School utilises online-written and audio artefacts in SAF but currently does not recognise any use of video in SAF activities. Hence, the students are more familiar with the online-written and audio artefacts in SAF than video in the School. Subsequently, the qualitative student comments relate to their lack of familiarity with audio and video artefacts in SAF as their concerns. On the contrary, there are more students suggesting the online-written ($\overline{X}_{WP}$=4.12) in SAF to improve their performance than video ($\overline{X}_{VP}$=3.83) and audio ($\overline{X}_{AP}$=3.73) artefacts on a five-point scale.

6.4. Pre-intervention Test Overview and Findings

This survey is called students' willingness to use different MMAs in their module and conducted amongst the intervention (control and test) groups to measure their SAF perceptions. These groups are all first-year undergraduate students (n=296) with 9.8% participation rate and all first-year postgraduate students (n=27) with 37% participation rate.

Therefore, the overall participation rate was around 12% (n=39). Due to low participations amongst first-year undergraduate students and relatively small postgraduate student numbers in the School, the descriptive statistics of findings are provided in the study (Table 6.29).

6.4.1. Descriptive Data Summary for Pre-intervention Survey in Intervention Group

Pre-intervention Test Survey in Intervention Groups	Choice	Undergraduate first-year		Postgraduate first-year	
		Count	Percent (%)	Count	Percent (%)
Q7. Have you received **online-written** feedback in SAF before?	Yes	7	24.1	9	90
	No	16	55.2	0	0
	Unsure	6	20.7	1	10
Q7B. If No, are you willing to use **online-written feedback** in your course?	Yes	27	93.1	10	100
	No	1	3.4	0	0
	Unsure	1	3.4	0	0
Q8.Have you received **audio** feedback in SAF before?	Yes	0	0	0	0
	No	28	96.6	10	100
	Unsure	1	3.4	0	0
Q8B. If No, are you willing to use **audio** feedback in your course?	Yes	21	72.4	7	70
	No	3	10.3	0	0
	Unsure	5	17.2	3	30
Q9. Have you received **video** feedback before?	Yes	1	3.4	2	20
	No	27	93.1	8	80
	Unsure	1	3.4	0	0
Q9B. If No, are you willing to use **video** feedback in your course?	Yes	21	72.4	9	90
	No	5	17.2	0	0
	Unsure	3	10.3	1	10

Table 6.29: Pre-intervention Test Survey in Intervention Groups

6.4.2. Pre-intervention Test Survey Overview and Conclusions

6.4.2.1. Online-written Artefact in SAF

For first-year undergraduate students, although only a quarter (n=7, 24%) have experienced the use of online-written artefacts in SAF activities before, almost all (n=27, 93%) are still willing to use it in their course. Conversely, as nearly all first-year postgraduate students (n=9, 90%) have experienced the online-written artefact in SAF, all suggest a continuation of its use. When these findings are compared with the previous School-wide survey, the findings align with students being more familiar with the online-written artefact in SAF than audio ($\bar{X}_A$=1.50) and video ($\bar{X}_V$=1.44) in the School (Table 6.14). Nonetheless, such a lower familiarity rate amongst undergraduate students could depend on their new involvement in SAF with online-written artefacts in the School. Conversely, a high familiarity amongst the postgraduate students can relate to a continuation from their undergraduate studies with the mandatory use of online-written artefacts in the School since 2016.

In the pre-test survey, there are two indicative qualitative comments by first-year undergraduate students to describe their positive experiences for the online-written artefact in SAF activities. Two of these comments are supportive and highlight their goals in SAF as:

- *"Useful, easy to access" (Undergraduate first-year).*
- *"Very convenient" (Undergraduate first-year, Honours cohort).*

Similarly, the earlier School-wide survey shows that the six goals about preferring the online-written artefact to other MMAs in SAF (Table 6.14) are its usefulness, easy access, providing clarity, mobile learning, professionalism and personalisation.

On the contrary, another comment regarding the online-written artefact in SAF highlights the students' expectations between formative and summative assessment activities:

"Written feedback for a formative assessment" (Undergraduate first-year).

Significantly, lack of engagement in SAF relates to being seen as their pass/fail categories and formative assessment as building up knowledge for the following summative assessment activity (Henderson and Phillips, 2014). Therefore, the students prefer more structure in their formative assessment feedback compared to SAF (Wing, 2018; Zimbardi et al., 2017).

Finally, aligning with the pre-test survey, the School-wide survey also shows that more students suggest the use of online-written artefact in SAF ($\bar{X}_W$ =4.12) to improve their performance than video ($\bar{X}_V$ =3.83) and audio ($\bar{X}_A$ =3.73). However, the ANOVA test results indicate that there are still (statistically significant) differences between groups for the online-written artefact in SAF, affecting their

OSO through its faster to learn, easier to remember and paying more attention goals (Table 6.24).

6.4.2.2. Audio Artefact in SAF

In the School, both online-written and audio artefacts in SAF are recognised in its Charter as opposed to the video artefact. Similarly, the findings in the School-wide survey also indicate that the students are more familiar with the audio artefact ($\bar{X}_A$=1.50) in SAF than video ($\bar{X}_V$ =1.47). However, during the pre-test survey, students in the intervention groups mention that they are not familiar with audio artefacts in SAF (undergraduate=0%, postgraduate=0%). Although for the undergraduate degree students, these differences could be related to their first-year of study in the School, the first-year postgraduate degree students also suggest not having previously experienced any audio artefact in a SAF activity. Conclusively, although the mandatory online-written artefact in SAF is highlighted in the School, any mandatory use of audio is not mentioned (Assessment Charter, 2018).

Previously, the School-wide survey shows that the use of audio artefacts in SAF activities has consistently ranked the lowest amongst all goals compared to online-written and video. Similarly, in the pre-test survey, although many students (undergraduate n=21, 72%; postgraduate n=7, 70%) are willing to use the audio artefact in SAF activities, there are more students selecting the

"unsure" option for the audio (undergraduate n=5, 17%; postgraduate n=3, 30%) than the other MMAs in the intervention groups.

Finally, despite the easier to remember goal for audio ($\bar{X}_A$=3.48) being still lower than any other artefact, the ANOVA test concludes that there are still differences between groups (Table 6.30).

Operation	**Differences**
Independent Variable (Goal):	Q28. Easier to remember
Dependent Variable:	Q14. My performance is improved with the use of audio artefact in SAF.
H4:	Easier to remember has an effect on improving their performance with the audio artefact in SAF.
1st difference:	There are statistically significant differences between "Agree" and "Disagree" groups for finding it easier to remember with audio in SAF to improve their performance. "Agree" group suggests that easier to remember with audio in SAF improves their performance. Mean difference is 0,950.
2nd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for finding it easier to remember with audio in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember with audio in SAF improves their performance. Mean difference is 1,500.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for finding it easier to remember with audio in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember with audio in SAF improves their performance. Mean difference is 0,772.

Table 6.30: H4 Hypothesis, Easier to Remember and Audio Artefact

Thus, although being more familiar with audio in SAF than video in the School, there are still differences between them for finding it easier to remember with the audio artefact in SAF to improve their performance.

6.4.2.3. Video Artefact in SAF

Despite not being recognised in the Charter (2018), a few students mention in the intervention groups that they (undergraduate n=1, 3%; postgraduate n=2, 20%) are more familiar with the video artefact in SAF than audio. However, the earlier School-wide survey shows that less students are familiar with the video artefact in SAF ($\bar{X}_V$ =1.44) in the School. Moreover, although almost all postgraduate students (n=9, 90%) are more willing to use the video artefact in SAF than the audio (n=7, 70%), the undergraduate first-year students' willingness to use video in SAF (n=21, 72%) remains the same as the audio artefact (n=21, 72%) in the intervention groups.

Meanwhile, the goals for choosing the video artefact in SAF to the other MMAs in the School (Table 6.14) are faster to learn, easier to remember, paying more attention and providing more information respectively. However, during the latter pre-test survey (Table 6.29), when asked to rate their willingness to use the video artefact in SAF, there are more students choosing the "No" option amongst the undergraduate first-year students (n=5, 17%) than the audio (n=3, 10%) and online-written (n=1, 3%) options in the

intervention groups. Hence, this implies that the School's Assessment Charter still has a strong influence through its established rules in the teaching-learning culture by actively promoting the use of the online-written artefacts, partly mentioning audio artefacts and ignoring video artefacts in SAF. Finally, the ANOVA test results conclude that there are statistically significant differences between groups for video in SAF affecting their OSO under all goal categories (Table 6.24). Similarly, during the pre-test survey in intervention groups, when considering overall negative emotions (both "No" and "Unsure"), more students suggest negative emotions towards the use of video (undergraduate n=8, 28%) and similar with audio (undergraduate n=8, 28%) compared to the online-written (undergraduate n=4, 7%) artefact in SAF.

6.5. Post-intervention Test Overview and Findings

6.5.1. Technology-Enhanced Education: Analysing Online SAF System Data in Test Groups

This section relates to the online SAF system built in the university to support educational provision for teaching-learning in SAF to enable communication and access to SAF resources.

During the post-intervention test operations, all OSCE feedback with audio and video artefacts in the test groups is uploaded into the University's multimedia server to comply with the Assessment Policy (2015). Then, these links with final grades are published on the online SAF system.

As well as the student numbers collecting their SAF in the test groups over a one month period, average length of each SAF with audio and video recordings are measured for a more robust understanding of SAF with MMAs in the School.

6.5.1.1. Access into Online SAF with MMAs

Amongst the test groups over a month period:

- In the first-year undergraduate cohort (n=38), 2 students did not attend the examination. Out of 36 students, 4 students (11%) did not collect their SAF with audio and video artefacts.
- In the first-year postgraduate cohort (n=10), 1 student did not attend the examination. All (n=9) collected their SAF with audio and video artefacts.

Similarly, as indicated in the earlier findings under the familiarity goal, their lack of familiarity with both the online SAF system and the School's Charter (2018) rules in the community has resulted in some students ignoring their SAF with MMAs.

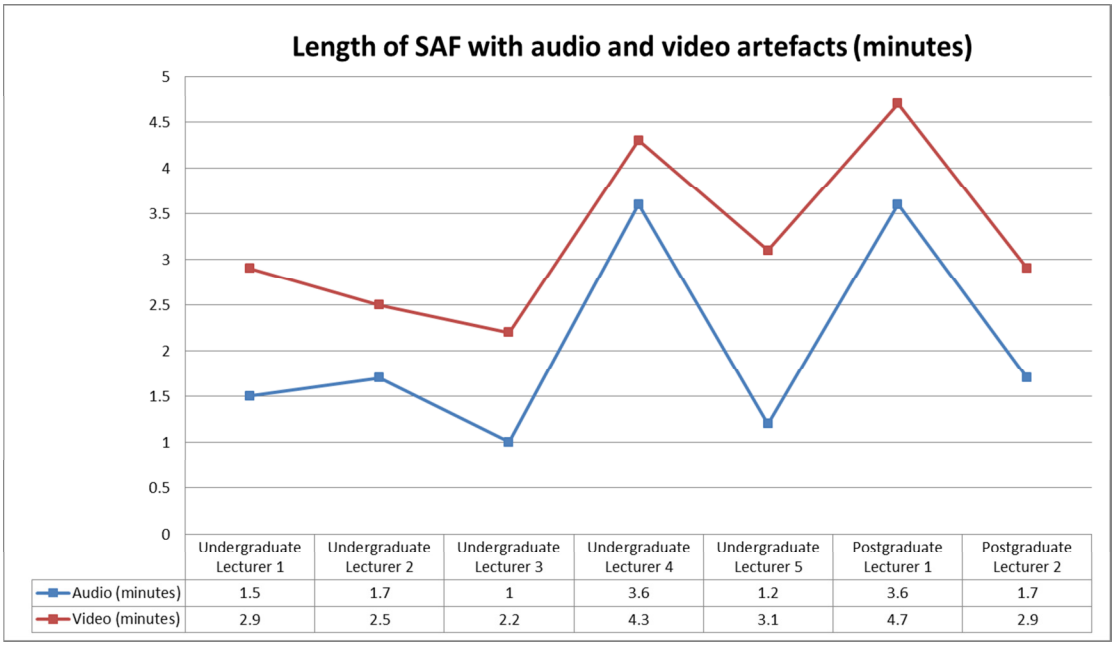
6.5.1.2. Length of SAF with Multimedia Recordings

Average lengths of SAF with MMAs recordings (Table 6.31) show that the video artefacts in OSCE feedback are much longer (undergraduate=47%, postgraduate=27%) than audio in test groups.

Level	Audio (minutes)	Video (minutes)	Increase (%)
Undergraduate degree	1.8	2.65	47.2%
Postgraduate degree	3.0	3.8	26.6%

Table 6.31: Average length of OSCE feedback

Moreover, for each lecturer on different study levels (i.e. under/postgraduate), the total length of each multimedia recording are also varied (Table 6.32).



	Undergraduate Lecturer 1	Undergraduate Lecturer 2	Undergraduate Lecturer 3	Undergraduate Lecturer 4	Undergraduate Lecturer 5	Postgraduate Lecturer 1	Postgraduate Lecturer 2
Audio (minutes)	1.5	1.7	1	3.6	1.2	3.6	1.7
Video (minutes)	2.9	2.5	2.2	4.3	3.1	4.7	2.9

Table 6.32: Average length of MMAs in study levels

In essence, as the word count in audio artefacts is on average eight times higher than online-written (Nemec and Dintzner, 2016), there is a sharp difference in SAF volume for each lecturer relating to its length in the School.

Besides, for six students with 'fail' grades in the undergraduate cohort, lengths of their audio and video recordings significantly increase, on average 52% in audio, 57% in video (Table 6.33).

Count	Undergraduate Lecturer (UGL)	Audio (minutes)	Video (minutes)
1.	UGL1	1.4	4.38
2.	UGL2	1.53	3.59
3.	UGL2	2.57	3.45
4.	UGL3	2.03	3.25
5.	UGL4	3.53	4.03
6.	UGL4	5.3	6.22
Total Average (minutes):		**2.73**	**4.15**

Table 6.33: Average SAF length in fail-grade groups

6.5.1.3. Conclusions on SAF System Data

Despite no clear standardisation attempts in SAF volume in the School (Assessment Charter, 2018), analysing the system data amongst the test groups demonstrates that there are differences in OSCE feedback length between audio and video artefacts, such as video artefacts being longer. In addition, there are further differences amongst all lecturers about providing OSCE feedback length (i.e. volume). However, these differences are even bigger amongst pass/fail-grades and undergraduate/postgraduate groups in SAF teaching-learning experiences with different MMAs.

6.6. Technology-Enhanced Learning: Overview and Findings of Student Interviews in Post-intervention Conditions

Following the interventions, regarding the second research question (SRQ2) to explore the students' experiences for the actual use of different MMAs in SAF activities, (semi-structured) one-to-one student interviews are conducted to elicit students' opinions in the School. This semi-structured approach mirrors the effectiveness, efficiency, transformation motives and eleven goals.

Henceforth, there are eleven student interview subjects. Seven of them (e.g. UGS) are undergraduate students in the experiment group. Three of them are part of the ESOL group (e.g. UGS-ESOL) and another is part of the disability group with dyslexia (e.g. UGS-Dyslexia). Additionally, one undergraduate student is part of the control group (e.g. UGSC). Finally, three postgraduate students (e.g. PGS) are interviewed.

6.6.1. MMA Characteristics through Goals

6.6.1.1. Familiarity Goal

During the post-test conditions, firstly, the student comments about their familiarity with the online-written artefact in OSCE feedback concur with the high score of the School-wide survey findings ($\bar{X}_w$ =2.79) compared to audio and video (Table 6.14). However, their familiarities are varied due to the HE, high schools and further

education (FE) systems in SAF teaching-learning culture actively promoting the online-written artefacts in SAF. For example:

(UGS1): *"I studied HNC nursing course in a further education College before. I am used to receiving digital feedback but I really didn't know what to expect from the video or audio."*

(PGS5): "*while I was on studying my honour degree in the School, we got online-written feedback but it is my first experience of using audio and video for assessment feedback".*

By contrast, adult learners in post-graduate level can have no experiences with MMAs in SAF as:

(PGS6): "*I saw all of them but it was the first time that I received SAF with any MMAs*".

Secondly, due to their lack of SAF cultural developments, the students may have inadequate student engagement and responsiveness to SAF with MMAs, despite specific expectations of lecturers. For instance, four students (11%) in the undergraduate group did not collect their SAF. However, all postgraduate students collected their SAF. This is highlighted by a previous second-year student comment in the School as *"only accessing the SAF recently for the reason of receiving low grade"*. Consequently, while the DoL for lecturers in the School is described as *"marking assessments and providing detailed feedback take an extensive amount of time*, *therefore, it is appropriate for lecturers to expect the feedback to be*

used and acted upon" (Assessment Charter, 2018). Similarly, the lecturers can equally feel disappointed by the lack of student engagement and responsiveness to SAF (West and Turner, 2016). Yet, the School's SAF system delivering final grades to students before they read their SAF is a weakness (Cann, 2014). Correspondingly, the following comment is indicative of why some students are not interested in SAF:

(UGS3): *"I wasn't sure what to expect to be honest from different multimedia in SAF; I was more worried about my final grade than the feedback".*

Moreover, for some students in first-year undergraduate and postgraduate groups, receiving SAF can be a new activity:

(PGS7): *"I'm an adult learner. When I was in the university during my undergraduate degree, we didn't use get any feedback from summative exams. Now, for my master degree in here, it seems to be different. I was pleased to get feedback".*

(PGS6): *"It is all new to me, I was interested to see what it would be like. But I knew the feedback was important".*

However, highlighting the importance of SAF rather than their final grades also aligns with the School's Assessment Charter (2018) about lecturer and student expectations. For example, the Charter mentions online management of summative assessment without identifying any volume of SAF content because further

standardisation of SAF volume with online-written artefacts can equally have a risk of restricting SAF to margins of essays and rubrics for student engagement (Phillips et al., 2016). On the contrary, due to a lack of standardisation, the earlier findings in the School demonstrate that there are differences in SAF volume, such as 'fail' grades receiving larger volumes of SAF over 'pass' grade students (Table 6.33). While this might be considered as providing more support for 'fail' grade students from the lecturer perspective, from a student perspective receiving a non-equivalent volume in SAF can suggest being treated unfairly in the same module by the same lecturer, lack of consistency in different lecturer's comments, and differences compared to other modules (Watkins et al., 2014) such as:

(PGS5): *"Written feedback also depends on the lecturer. We don't always get the same amounts of feedback. Sometimes my feedback was not enough. Especially, if your grade was low, we should get more feedback, but then it is not fair for the others doing well too. It varied in different modules".*

On the other hand, a higher volume of SAF can equally cause some students to ignore the SAF (Sherman and Pullen, 2017) as:

(UGS-ESOL4): *"In my country, we don't have similar e-learning systems like here. Our classrooms are always around face-to-face teaching. We got online-written feedback from another module*

here, but it was very long. As I knew I passed the module. I read the feedback once so that I don't miss anything".

(PGS5): *"If the online-written feedback is very long, then I jump to the relevant section".*

Notably, there is a risk of students scanning longer online-written text in SAF. However, as word counts in audio and video artefacts are much higher compared to online-written artefact (Nemec and Dintzner, 2016) and beneficial for producing a higher volume of SAF in HE (McCarthy, 2015; Cann, 2014), there is a risk of students' attention diminishing during long audio and video recordings (Hepplestone et al., 2011). Thus, any standardisation attempts by MMAs in SAF should consider these varying student behaviours.

Thirdly, in ANOVA test results, there is a statistically significant difference between "Undecided" and "No" groups for being familiar with video in SAF to improve their performance in the School (Table 6.25). Thus, some students may not be familiar with the use of different MMAs in the VLE. For example, the following student comment validates wider unfamiliarity issues with MMAs (e.g. interface and layout) and the VLE:

(UGS1): "*I thought the video feedback was quite useful, after you get over the initial orientating yourself to it*".

Hence, the students still require additional guidelines for the use of different MMAs in SAF, despite these tools often being used for teaching-learning activities in the School.

6.6.1.2. Usefulness Goal

The students find the online-written artefact ($\bar{X}_W$ =4.39) in SAF activities more useful than video ($\bar{X}_V$ =3.70) and audio ($\bar{X}_A$ =3.57) in the School. Additionally, the usefulness ($\bar{X}_W$ =4.39) and ease of access ($\bar{X}_W$ =4.39) of the online-written artefacts are the highest scoring goals. Yet, there were previously contradictory views on its usefulness as *"audio or video should be optional"* and *"a range of feedback would be good"* in the School.

Meanwhile, despite no statistically significant differences between the groups regarding the usefulness goal with online-written and audio artefacts in SAF to improve their performance, there are differences with the video artefact in the ANOVA test results (Table 6.26). Besides, regarding different levels of study groups (Table 6.20), the first-year undergraduate students prefer the audio artefacts in SAF compared to second-year undergraduate degree students in the School.

The student opinions about usefulness goals for the use of MMAs in SAF can be categorised into contextualisation, timing, and self-management.

6.6.1.2.A. Usefulness about Contextualisation

Contextualisation about its usefulness in SAF activities with MMAs is affected by two conditions: feedback/feedforward concepts and SAF for OSCE/essay type of assignments in the School.

Firstly, contradicting Ferrell and Gray's (2016) definitions about the 'feedback concept as to concentrate on weaknesses in details by providing all answers' and the 'feedforward concept as to be developmental and motivational', the School's Assessment Charter (2018) highlights these pedagogic concepts as "*Feedback is phrased in constructive ways for strengths and development areas. Feedforward doesn't mean answers are always provided, but student are directed to other resources*". However, the feedforward concept in SAF activities with online-written artefacts can often become describing and justifying students' grades for final evaluations through formal and generalised standard comments rather than encouragement (Rea and Cochrane, 2008). On the contrary, the video artefact in SAF mediates more visual, conversational, motivational, informal and less structured ways, and therefore, is more suitable for 'feedforward' comments rather than formally identifying mistakes in detail through its written structure. Similarly, student comment indicates formal structure of the online-written artefact in SAF as:

(PGS6): "*My online-written feedback was very structured. So it was good in this way. But it felt a bit too formal. It was like somebody was grading your work*".

Despite annotations with online-written artefacts in SAF becoming useful for referring to new resources directly (Sopina and McNeill, 2015), its standardisation with annotated feedback can limit SAF to margins of essays and rubrics (Phillips et al., 2016). For example, some students do not find annotated SAF in the online-written artefact to be constructive, help them see improvements, or be satisfied with its quality (Watkins et al., 2014) because such standardised generic and formal comments are not essentially changing the lecturers' formal writing styles relating to:

(PGS5): "*I start to see feedback more like guidelines than formal information. Yet, written feedback always sounds very formal…There are some standard texts to make it sound more academic and formal. After receiving so many written feedback, you start to recognise these sentences but video also gave better guidelines*".

Besides, as positive emotional word counts in audio are higher than negative emotional word counts (Nemec and Dintzner, 2016), both audio and video artefacts become more motivational due to tone of a lecturer's voice in audio and video artefacts mediating an informal and easier to interpret style (Harrison et al., 2015; Lamey, 2015). For instance:

(UGS2): *"I thought written was a bit book like. Very standard words. I think written feedback was more like lecturing me. We are getting too many emails. So, I think reading the feedback felt similar to reading my emails. But, my video was very motivational. More like support than criticism. She was really trying to help me, even you know it's the same information"*.

However, there is a downside to audio comments:

(UGS2): *"Audio was too fast to understand. I had to listen it twice so I can say least favourable".*

Hence, the feedforward concept is best suited for the use of video artefacts, as indicated by the students preferring the video artefact in OSCE feedback for its usefulness to online-written and audio.

Secondly, to compare the OSCE type with other summative assessment types, the School's Assessment Charter (2018) describes its rules for practical summative assessment feedback to focus on students' professionalism, performance and presentation skills. Aligning with the School's SAF rules, some students argue a need for contextualisation of different summative assessment types because of their changing experiences through different MMAs in various SAF contexts:

(UGS1): *"Audio and video are good for revisions and confirmation… I can see the values of it particularly for the skills modules (OSCE)*

because it's very much looking at what you are doing and how you're doing it".

Contrary to this finding, many studies for the video artefacts in essay type assessment feedback imply that video artefacts are equally effective, efficient and promote transformation in SAF for essay type of assignments in the literature review section.

Besides, although the School's ESOL students prefer the online-written artefact in SAF activities more than EFL groups in the earlier survey, one ESOL student group similarly mentions a risk of overwhelmingly relying on online-written text in the School by:

(UGS-ESOL9): "*I liked the video because it is practical and I can see it. But we get a lot of theory and written text when we are in the School. Learning from these texts all the time can get boring very quickly*".

6.6.1.2.B. Usefulness about Timing

Any delays of SAF can make feedback irrelevant for students because they would likely to move into new activities (Rea and Cochrane, 2008). Hence, timing of SAF is important. For example:

(PGS5): "*I remember that the system was not working for two days when were supposed to get the grade and feedback. I had to phone the School to learn my grade. When I got the feedback two days later, I had already known the grade and lost the interest*".

However, as a formal rule in the School, the standard timing of SAF delivery is four weeks. Besides, contradicting with Lunt and Curran (2010) about audio and Crook et al. (2012) about video being faster to produce in SAF, Zimbardi et al. (2017) demonstrate that producing an audio artefact in SAF can take much longer than online-written. Similarly, when considering additional time required for preparation, recording, editing and distributing these MMAs under the intervention conditions, I observed the same operational burden in the School. Therefore, any attempts to adopt the use of audio or video artefacts in OSCE feedback must take into consideration larger cohort numbers and the standard four weeks production period. Nevertheless, when compared to hard-copy, online SAF provides immediate availability (Watkins et al., 2014), as one student suggests:

(UGS1): "*I am used to receiving digital feedback. It is very practical and faster than paper-copies*".

Furthermore, the usefulness is equally connected to the students' views on their speed of learning in SAF with different MMAs. For example, the earlier findings in the School indicate that faster to learn ($\bar{X}_V$ =4.13), ease of access ($\bar{X}_V$ = 4.12) and easier to remember ($\bar{X}_V$ =4.07) are the highest scores relate to video in SAF, despite its usefulness ($\bar{X}_V$ =3.70) being much lower in their experiences. Similarly, one student argues that:

(PGS5): "*I know some students don't read their SAF when they learn their grade. For video feedback, I didn't feel this because I knew the video was going to shorter and faster to watch*".

However, notably, overall average lengths of video artefacts in SAF are much longer than audio and online-written text in the study.

6.6.1.2.C. Usefulness about Self-Management

For usefulness of SAF with MMAs, students should self-manage their learning activities through engagement, motivation, confidence and reflection (Nicol and MacFarlane-Dick, 2006; Scott, 2017). For example, the pre-intervention test survey shows that almost all first-year undergraduate (n=27, 93%) and postgraduate (n=9, 90%) students are willing to use online-written artefacts in SAF in their courses. However, while almost all postgraduate students (n=9, 90%) are more willing to use the video artefact in SAF, the undergraduate students' willingness to use video in SAF (n=21, 72%) is much lower in the intervention groups. Consequently, during the post-intervention test interviews, two student comments identify different characteristics of each MMA and their benefits in SAF activities as:

(UGS2): *"But receiving all three versions was so handy. I think I was more focusing on the voice on the audio and try to understand the points were crucial for me. I did prefer the video because I felt*

like I'd like to see the person. I think if your videos don't work that well for you, then you can have audio to listen".

(UGS1): "*Depends, it felt like they had different uses for me. It is difficult to choose between them*".

Subsequently, while SAF activity with face-to-face (synchronous) format can become impractical and reliant on student memory on the day, online-written comments can also be limited in depth and open to multiple interpretations by causing uncertainty amongst students (Henderson and Phillips, 2014). Yet, asynchronous nature of the audio artefact in SAF can cause similar issues by being impractical and reliant on student memory as follows:

(PGS7): "*Audio feedback was difficult to remember. For example, I was easily able to go back and search for a specific sentence with video and written feedback. It was difficult to remember where to find the information within audio. There is no signposting or markers for reference on it".*

On the contrary, Cann (2014) still suggests a mixture of observations in laboratory notebooks to be difficult to convert into the online-written format, and thus, proposes audio-only SAF through its connectedness, timeliness, and perceived relevance.

Subsequently, when comparing the video artefact to online-written in SAF activities, many students find video in SAF more personal, supportive, effective at revitalising their enthusiasm, and prompting

reflection. However, some may be hesitant to use it due to being unable to match the video feedback to relevant sections in their written assignment (Henderson and Phillips, 2014). Hence, training students for relevant SAF rules is crucial through a balanced combination of exemplars, rubrics and different MMA (Broadbent et al., 2018). Moreover, many students believe annotations in online-written artefacts to be more useful for referring directly to new resources (Sopina and McNeill, 2015). Similarly, not aligning with Cann's (2014) findings about effectiveness of audio-only artefacts in SAF for essay types of assignment, the following student comment in the study is indicative of the importance of referring directly to new references in SAF as:

(PGS6):*"For the similar clinical practice assessments (OSCE), I prefer to receive video feedback. For an essay exam, I am not sure. For our essay exams, we are getting longer feedback with additional references. In this case, maybe online-written feedback might be better".*

In fact, the intervention groups in the study often repeat this indicative student comment.

6.6.1.3. Faster to Learn Goal

Previously, faster to learn ($\bar{X}_V$ =4.13) with the video artefact in SAF was the most popular goal amongst other video artefact related goals in the School (Table 6.14). Similarly, during the post-test

conditions, many students suggest that they learn faster with the video artefact in OSCE feedback because video in SAF is more effective and engaging (Cann, 2014; Henderson and Phillips, 2014). Equally, the students often relate faster to learn with the video artefact in SAF to the other video artefact related goals, including easier to remember ($\bar{X}_V$ =4.07) and paying more attention ($\bar{X}_V$ =4.07) as follows:

(PGS7): "*It took me longer to read the feedback, but it was very fast to watch and learn in the video. Video felt more interesting and relevant somehow. With written text, you tend to skim over the text sometimes and not take in all the details. But somebody is taking to you, you are more inclined to listen, watch, and take in the details*".

Aligning with these findings, the previous findings in the survey indicate that the students also find the video in SAF ($\bar{X}_V$ =4.13) to be faster to learn than the online-written ($\bar{X}_W$ =3.65) and audio ($\bar{X}_A$ =3.64) artefacts. For instance:

(PGS5): "*I thought the lecturer has explained everything faster in video rather the written format. I found the audio very confusing to follow up the sections the lecturer was mentioning. I think learning by watching is much faster too….For my performance, I think I remember more from the video than written text".*

Subsequently, the audio artefacts in SAF are lacking visual descriptions for its effectiveness (McCarthy, 2015; Gould and Day,

2013). Hence, although many students can be satisfied with the audio artefact in SAF, some students still prefer the online-written artefact for making sense of visual comments by annotations (Morris and Chikwa, 2016). In fact, lack of visual cues for signposting in the audio artefact in SAF can become an issue for review and revision purposes:

(PGS7): "*audio feedback was difficult to remember. For example, I was easily able to go back and search for a specific sentence with video and written feedback. It was difficult to remember where to find the information with audio. There is no signposting or markers for reference on it".*

Furthermore, length of audio recordings is also crucial, due to a risk of students' attention diminishing during long asynchronous recordings (Hepplestone et al., 2011). For example, regarding the students with disabilities in the School, the student mentions that:

(UGS10-Dyslexic): "*I am dyslexic. So, reading can be slower, seeing and hearing is much faster. I much prefer the video because I can watch and hear it. But, I am also comfortable with audio. If multimedia is too long, I can't concentrate*".

On the contrary, although average length of the video artefacts in OSCE feedback are higher than audio under the intervention conditions, many students feel that SAF with the video artefact is faster to learn through both visual demonstrations and auditory

descriptions as well as motivational with positive emotional words, rather than textual referencing errors (Henderson and Phillips, 2014; Turner and West, 2016; Harrison et al., 2015). The following student comment is indicative of their common agreements in the study:

(UGS3): "*I wouldn't say SAF with any multimedia were too long or short, but I was listening and watching the lecturer, so video feedback had a bigger impact on me. I think the written one was more confusing because I was looking for what I did wrong on the assessment*".

Next, there is a potential risk of ESOL students finding it more difficult to understand speed of verbal communications and various accents in audio and video artefacts (Voelkel and Mello, 2014) as:

(UGS-ESOL9): *"I think it was also important for me that my lecturer is talking very slowly on the video so I can understand everything said on the video".*

Finally, in the School, there are no statistically significant differences between the students for faster to learn with audio artefacts in SAF to improve their performance. However, the ANOVA test concludes that there are differences for the use of online-written and video artefacts (Table 6.34 and Table 6.35).

Operation	**Differences**
Independent Variable (Goal):	Q18. Faster to learn
Dependent Variable:	Q13. My performance could be improved with the use of online-written artefact in SAF.
H1:	Faster to learn has an effect on improving students' performance with online-written artefact in SAF.
1st difference:	There is a statistical difference between "Strongly Agree" and "Disagree" groups for faster to learn with online-written in SAF to improve their performance. "Strongly Agree" group suggests that faster to learn with online-written in SAF improves their performance. Mean difference is 0,700.
2nd difference:	There is a statistical difference between "Strongly Agree" and "Agree" groups for faster to learn with online-written in SAF to improve their performance. "Strongly Agree" group suggests that faster to learn with online-written in SAF improves their performance. Mean difference is 0,480.

Table 6.34: H1 Hypothesis, Faster to Learn and Online-Written Artefact

Operation	**Differences**
Independent Variable (Goal):	Q36. Faster to learn
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H9:	Faster to learn has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for faster to learn with video in SAF to improve their performance. "Strongly Agree" group suggests that faster to learn with video in SAF improves their performance. Mean difference is 2,039.
2nd difference:	There are statistically significant differences between "Agree" and "Disagree" groups for faster to learn with video in SAF to improve their performance. "Agree" group suggests that faster to learn with video in SAF improves their performance. Mean difference is 1,392.
3rd difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for faster to learn with video in SAF to improve their performance. "Undecided" group suggests that faster to learn with video in SAF improves their performance. Mean difference is 1,046.
4th difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for faster to learn with video in SAF to improve their performance. "Strongly Agree" group suggests that faster to learn with video in SAF improves their performance. Mean difference is 0,993.

Table 6.35: H9 Hypothesis, Faster to Learn and Video Artefact

Thus, although faster to learn ($\bar{X}_V$ =4.13) is the highest score for the video artefact in SAF, there are still statistically significant

differences between the students for faster to learn to improve their performance with video artefacts in the School.

6.6.1.4. Easier to Remember Goal

Previously, it is easier to remember SAF with the video artefacts ($\bar{X}_V$ =4.07) than online-written ($\bar{X}_W$ =3.73) and audio ($\bar{X}_A$ =3.48) in the School. Additionally, both easier to remember ($\bar{X}_V$ =4.07) and paying more attention ($\bar{X}_V$ =4.07) goals are the second most popular choices for the video artefact. Consequently, during the post-test conditions, the students often relate easier to remember SAF in the video artefact to the faster to learn ($\bar{X}_V$ =4.13) and paying more attention ($\bar{X}_V$ =4.07) goals. This is due to both verbal and visual descriptions increasing attention and holding focus to ensure comprehension of SAF (St. Amant, 2018; McCarthy, 2015; Phillips et al., 2016; Marriott and Teoh, 2012). The following comment is indicative for many students:

(UGS-ESOL4): "*I think video feedback was more interesting. I remember more about what my lecturer said from the video than audio now. The lecturer summarised the important points for me and showed the correct way of doing it*".

Comparatively, despite its auditory descriptions, both clues through visual representations and demonstrations are still absent in audio artefacts for easier to remember SAF. As a result, the students

often feel that it is difficult to remember for forming meaning from such auditory descriptions:

(PGS5): *"For the audio feedback, I felt I was looking at empty screen and trying to image the exam".*

Relating to multimodality and affordance of video artefact, one student further highlights that even the location of SAF recordings as a clue is important to visualise and remember the assessment context by:

(PGS1): *"The video was recorded in the same room where I had my exam. So, it felt like I was in the room again. Then, it was easier to remember".*

Online-written artefacts in SAF without both auditory and visual modalities, can become static, less substantial, and open to different interpretations causing uncertainty (Henderson and Phillips, 2014; Marriot and Teoh, 2012) as well as restricting students to mostly written communications in SAF activity (Phillips et al., 2016). Effective summaries of complex sentences require generating visual representations for being easier to remember (UzZaman et al., 2011) as:

(UGS3): "*Because you are seeing it, it is easier to remember. I was also trying to visualise my assessment for what I did. For instance, if I am going into an exam and I forget, I can think back the picture in my head and all comes back to me*".

By contrast, online-written artefacts in SAF could lead students to see the areas requiring focus and attention comprehensibly because they are already familiar with receiving paper-based written SAF (Hepplestone et al., 2011). Aligning with the students' higher familiarity, usefulness ($\bar{X}_w$ =4.39) and providing clarity ($\bar{X}_w$ =4.05) goals for the online-written artefact in the School, some students equally highlight that:

(UGS1): "*In terms of receiving only one type in modules, I would prefer getting the video in this module. But I would still need a written version too. So, video and online-written feedback were the ones that were useful for me. I think that's more useful for going ahead in terms of reading and seeing it*".

Similarly, for dyslexia, this student also recognises the different benefits of each MMA:

(UGS1-Dylexia): *"I like the video for my practical work as I can listen to what being said. Online-written was good too because it would focus particular areas. I tend to highlight the keywords in online-written feedback, so that I can remember what was said in each paragraph. I have the software on my laptop. It would create me a text to speech video. It is very useful and necessary for me".*

Finally, as easier to remember with the video artefact is much higher than online-written and audio in SAF, their differences in the School are also apparent in their choice for OSO. For example, the

ANOVA test concludes that in the School there are statistically significant differences between the students for easier to remember with all MMAs in SAF to improve their performance (Table 6.30, Table 6.36 and Table 6.37).

Operation	**Differences**
Independent Variable (Goal):	Q19. Easier to remember
Dependent Variable:	Q13. My performance could be improved with the use of online-written artefact in SAF.
H2:	Easier to remember has an effect on improving their performance with online-written artefact in SAF.
1st difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for easier to remember with online-written in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember with online-written in SAF improves their performance. Mean difference is 0,674.
2nd difference:	There are statistically significant differences between "Strongly Agree" and "Agree" groups for easier to remember with online-written in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember information with online-written in SAF improves their performance. Mean difference is 0,519.

Table 6.36: H2 Hypothesis, Easier to Remember and Online-Written Artefact

Operation	Differences
Independent Variable (Goal):	Q37. Easier to remember
Dependent Variable:	Q15. My performance is improved with the use of video in SAF.
H10:	Easier to remember has an effect on improving their performance with video in SAF.
1st difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for easier to remember with video in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember information with video in SAF improves their performance. Mean difference is 1,897.
2nd difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for easier to remember with video in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember information with video in SAF improves their performance. Mean difference is 1,184.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Agree" groups for easier to remember information with video in SAF to improve their performance. "Strongly Agree" group suggests that easier to remember information with video in SAF improves their performance. Mean difference is 0,814.

Table 6.37: H10 Hypothesis, Easier to Remember and Video Artefact

6.6.1.5. Paying More Attention Goal

Previously, the students suggest that the video artefact ($\bar{X}_V$ =4.07) helped them pay more attention to their SAF than online-written ($\bar{X}_W$ =3.54) and audio ($\bar{X}_A$ =3.44) artefacts in the School. Similarly, during the post-test conditions, the students often mention that while online-written in SAF is static and lacks auditory and visual descriptions, audio in SAF lacks the visual elements when compared

to video (McCarthy, 2015; Phillips et al., 2016; West and Turner, 2016; Henderson and Phillips, 2014; Marriott and Teoh, 2012). The following comment is indicative:

(UGS2): "*With the video, I paid more attention. It's almost like someone is speaking to you and then you act like they are around you. You might not really understand it unless it's being said to you. I like direct talking to me. I thought written was a bit book like. Very standard words. I think written feedback was more like lecturing me*".

Therefore, engaging with SAF through an asynchronous video artefact allows students to take more notice of dialogue and thus pay more attention to feedback compared to audio and online-written artefacts (Crook et al., 2012) because many students feel a closer emotional connection with the lecturer's visual presence (Parton et al., 2010). Similarly, the individual student interviews indicate that OSCE feedback with the video artefact is informal and easier to interpret by them interpret by them, similar to audio in OSCE (Harrison et al., 2015). On the contrary, the formality of written feedback in SAF is often related to the lecturers' attempts at linking the SAF discussions to the assessment grids to show students how to achieve the module learning outcomes in the School (Assessment Charter, 2018). Thus, there is a risk of some students considering audio and video artefacts to be informal feedback compared to the online-written due to a lack of standard

terminology in the School (McCarthy, 2015). Nevertheless, the video artefact in SAF for faster to learn ($\bar{x}_v$ =4.13) and easier to remember ($\bar{x}_v$ =4.07) and paying more attention goals is still more popular than online-written and audio artefacts under the effectiveness motive in the School. Subsequently, the paying more attention goal is often related to the visual presence of their lecturers in SAF with video:

(UGS3): "*Because I was listening and watching the lecturer, it had a bigger impact on me. It was also more fun to learn*".

(PGS6): *"I paid more attention to the video because she was talking about me. So, I wanted to hear what the lecturer was saying about me, however I skim the text".*

However, for audio artefacts:

(PGS6): "*With audio, I was more trying to think more about what I did during the assessment. Audio felt like recorded voice message to me. With video at least, I can see the lecturer talking to me*".

Moreover, despite a risk of students' attention diminishing during long asynchronous recordings (Hepplestone et al., 2011), no concerns for the length of audio and video artefacts in OSCE feedback are reported by the students under intervention conditions because the video and audio recordings were relatively short. Aligning with West and Turner's (2016) findings for the video

artefact being more human, real, and less ambiguous, the minority groups in the School highlight that:

(UGS-ESOL9): "*Video feedback feels like more human. I think the written text can be sometimes very long to understand*".

(UGS1-Dylexia) "*I paid much more attention to the audio or video than online-written because it is easier to learn for me in this way*".

Meanwhile, instead of the aim being to improve students' academic writing style through the online-written artefact, SAF with the video artefact can help the students to concentrate as:

(UGSC1): "*If it is something that I need to learn but I am not really interested, then I think the video will help me with my concentration rather than just listening because you are listening and seeing it".*

Finally, prior to any interventions in the School, the ANOVA test results indicate no statistically significant differences between the groups for paying more attention with audio in SAF to improve their performance. However, there are still statistically significant differences regarding the video artefacts (Table 6.38).

Operation	Differences
Independent Variable (Goal):	Q39. Paying more attention
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H12	Paying more attention has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for paying more attention with video in SAF to improve their performance. "Undecided" group suggests that paying more attention with video in SAF improves their performance. Mean difference is 1,167.
2nd difference:	There are statistically significant differences between "Agree" and "Disagree" groups for paying more attention with video in SAF to improve their performance. "Agree" group suggests that paying more attention with video in SAF improves their performance. Mean difference is 1,663.
3rd difference:	There are statistically significant differences between "Agree" and "Undecided" groups for paying more attention with video in SAF to improve their performance. "Agree" group suggests that paying more attention with video in SAF improves their performance. Mean difference is 0,495.
4th difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for paying more attention with video in SAF to improve their performance. "Strongly Agree" group suggests that paying more attention with video in SAF improves their performance. Mean difference is 1,055.

Table 6.38: H12 Hypothesis, Paying More Attention and Video Artefact

Following the intervention, more students suggest that they pay more attention to the video artefacts in OSCE feedback to improve their OSO.

6.6.1.6. Clarity Goal

Although the students suggest the online-written artefact in SAF ($\bar{X}_W$ =4.05) provides more clarity compared to video ($\bar{X}_V$ =3.97) and audio ($\bar{X}_A$ =3.29) in pre-test surveys, almost all participants suggest the video artefact in OSCE feedback provides more clarity compared to the other MMAs in post-test interviews. For example:

(UGS1): "*Audio and video are good for revisions and confirmation… I can see the values of it particularly in terms of the skills module (OSCE) because it's very much looking at what you're doing and how you're doing it".*

Nevertheless, as the audio artefacts in OSCE feedback are much shorter under the intervention conditions (Table 6.31), a lack of structure, speed, and visual descriptions with audio can create confusion and make it difficult to follow. This means that SAF with audio still requires a balanced combination of exemplars, rubrics and audio feedback in its pedagogic design (Broadbent et al., 2018). For example:

(PGS6): "*the clarity was great with video. It felt like the audio was longer and faster to follow*".

Regarding clarity in SAF with the use of online-written and audio artefacts in the School, the Charter (2018) suggests using:

- Guidance: module handbook, assessment guidelines
- Pedagogy: feedback, feedforward

- Criteria: rubrics
- Structure: annotation text in SAF for essay type of assignment

Therefore, the clarity goal in SAF with different MMAs is often associated with the students' ability to link their feedback to these resources in the School. For example, the use of online-written text in SAF provides clarity by annotation through detailed and structured text (Watkins et al., 2014), standardisation (Sopina and McNeill, 2015), and consistency in marking and formal communication (Rebecca and Tannous, 2015). However, during the post-intervention test interviews, the majority feel that the lecturers are providing clearer summaries, delivering additional demonstrations, and highlighting important points with verbal descriptions and visual demonstrations in the OSCE feedback with video compared to online-written and audio artefacts as:

(UGS-ESOL8): *"I will be more comfortable with video. I think the written feedback can be very detailed too. Written would be my second choice in this module".*

Hence, extensive use of standard written-text comments are not likely to be functional for a feedforward approach while in contrast the video artefact has the ability to facilitate clearer communication of feedback to overcome misinterpretations and standardisation of written-text in SAF through more direct expressions (Lamey, 2015; Borup et al., 2014). For instance:

(UGS3): *"Listening the lecturer actually points out where you went wrong and how you can improve it. I thought the video feedback was going to be very long to explain my feedback. But the video was shorter and clearer. There were things in the video that wasn't highlighted in the written feedback*".

On the contrary, Harrison et al. (2015) also report that the audio artefact provides clearer interpretations in OSCE feedback by communicating the relative importance of different points compared to online-written comments because online-written comments seem to have the same rank for information in OSCE feedback. Thus, the audio artefact in SAF is often perceived to be clearer and more comprehensive, engaging, and accessible (Pearson, 2018; Broadbent et al., 2018). Yet, although both online-written and audio artefacts in SAF have already been recognised in the School (Assessment Charter, 2018), around 30% of undergraduate and postgraduate students are still not willing to use or are "unsure" about using audio in SAF in the pre-test survey results (Table 6.29). Evidently, both providing clarity ($\bar{X}_A$ =3.29) and providing more information ($\bar{X}_A$ =3.37) with the audio artefact are the lowest scores amongst all goals in this study. Subsequently, aligning with Morris and Chikwa (2016) and McCarthy's (2015) findings, despite being satisfied with the audio artefact in SAF, the students perceive online-written and video artefacts as offering greater clarity when making sense of comments:

(UGS1): "*I mean the audio was good as well, maybe the audio didn't feel quite as precise and concrete. Not sure, it was difficult to follow*".

In addition, due to the lack of clarity in navigation without any markers/pointers, the students show hesitance towards the use of audio artefacts for review and revision purposes as:

(UGS-ESOL9): "*I think reading is less stressful than constantly rewinding audio to find the key points*".

Finally, during the pre-intervention test condition, the ANOVA test results show no statistically significant differences between groups when it comes to providing more clarity with the online-written and audio artefacts in SAF to improve their performance in the School. However, there are differences for video artefacts in SAF (Table 6.39).

Operation	**Differences**
Independent Variable (Goal):	Q35. Clarity
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H8:	Providing clarity has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Agree" and "Undecided" groups for providing clarity with video in SAF to improve their performance. "Agree" group suggests that providing clarity with video in SAF improves their performance. Mean difference is 2,214.
2nd difference:	There are statistically significant differences between "Agree" and "Disagree" groups for providing clarity with video in SAF to improve their performance. "Agree" group suggests that providing clarity with video in SAF improves their performance. Mean difference is 2,214.
3rd difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for providing clarity with video in SAF to improve their performance. "Undecided" group suggests that providing clarity with video in SAF improves their performance. Mean difference is 1,656.

Table 6.39: H8 Hypothesis, Clarity and Video Artefact

Hence, although the students' initial perceptions about the video artefact in SAF ($\bar{X}_V$=3.97) providing less clarity compared to online-written ($\bar{X}_W$ =4.05) in the School, there are also statistically significant differences between these student groups.

6.6.1.7. Ease of Access Goal

In pre-test findings, the online-written artefact ($\bar{X}_W$ =4.39) in SAF is viewed as easier to access than video ($\bar{X}_V$ =4.12) and audio ($\bar{X}_A$ =3.82) artefacts in the School. Noticeably, in comparison to other goals, ease of access in SAF with the use of any MMA has the highest score in student experience (on average Mean=4.11), followed by mobile learning (on average Mean=4.02) in the School. These findings imply that the students in the School find all MMAs in SAF easy to access.

Due to their different multimedia production formats, any technical issue can hinder students from accessing their SAF with MMAs and affect their OSO (Pearson, 2018; Carruthers et al., 2015). Notably, such a high pre-intervention test result of finding the online-written artefacts easier to access in SAF is linked with both receiving regular e-learning induction programmes and formal rules in the Charter that favours online-written artefacts in the School. Due to the students' nursing placements in NHS, the use of different MMAs in SAF can become challenging for nursing students because easy access still depends on internet speed, device and network capacity in rural areas. Nonetheless, several student comments indicate that:

(UGS-ESOL9): *"it was all very easy to access. I have a new laptop and phone. So, I don't have any problems accessing the content in the University".*

Correspondingly, many students prefer online-written artefacts in SAF for their ability to store alongside learning materials to enable them to refer to these resources easily (TELED, 2016; Reed et al., 2015; Ellis, 2013). However, although audio artefacts with their smaller file size over video are more efficient for downloading and storage (Lunt and Curran, 2010; Cann, 2014), the findings in the School-wide survey demonstrate that the students still find it easier to access the video artefact ($\bar{X}_V$ =4.12) compared to audio ($\bar{X}_A$ =3.82) in SAF.

Furthermore, when asked about the storage of MMAs, the students also report contradictory views as:

(PGS7): "*I watch them multiple times. Just to make sure I understand the feedback. I think that's the benefit of multimedia that you can watch it multiple times. I don't think I can download them. It would have been good if we were able to download them rather than try to access them through VLE all the time*".

(UGS1): "*I have downloaded the text and video versions. I didn't need the audio version*".

In fact, under the intervention condition, the audio and video artefacts in OSCE feedback were uploaded onto the University's internal multimedia server to activate their 'downloading' option in order to overcome the current weakness of the online SAF system

(GradeMark™), which does not allow downloading the audio artefact.

Next, although ease of access motive through all MMAs allows growth in e-learning (Carruthers et al., 2015), some ESOL students still prefer the use of online-written in SAF for its ease of access to store these artefacts for re-access and revision purposes in the School:

(UGS-ESOL4): "*I would still choose the written one because I can still print it out, hold it next to my work, and see what we are talking about. You can't do this with audio or video*".

Finally, although students find the video artefact in SAF ($\bar{X}_V$ =4.12) easier to access than audio in the School, the ANOVA test concludes that there are still statistically significant differences between students for ease of access with the video artefact to improve their performance (Table 6.27).

6.6.1.8. Providing More Information Goal

Aligning with the previous findings for analysing qualitative student comments in the School-wide survey, despite the online-written artefact in SAF being more focussed and structured (Lunt and Curran, 2010), it can also become less substantial and too detailed (McCarthy, 2015; Henderson and Phillips, 2014). For example:

(UGS1): "*We had the online-written SAF in another module. I think the markers are more focused of what they're trying to address and*

what feedback they're giving you in it. In the OSCE, it didn't matter because my lecturer was talking about sections instead of each sentence. So, I thought the video feedback was much better".

Therefore, the video artefact in OSCE feedback is providing better summaries by emphasising the key points. Additionally, lecturers' visual demonstrations and physical online presence carry out multiple messages through its multimodality. Notably, the MMAs in OSCE feedback did not include any imagery, animation or screencasts in the interventions. However, as a social practice for reconstructing the identities by visual demonstrations, body language and voice (Rowsell and Walsh, 2011), the video artefacts in OSCE feedback provide more information by enhancing the teaching-learning process (Rae and Cochrane, 2008). Similarly, OSCE feedback with video providing more information is a common agreement during the post-intervention test interviews:

(PGS5): *"I felt the importance of several sentences from her voice and body language. Also, I felt the lecturer gave better explanations on the video by showing the exercise and where I did wrong".*

Another strength of the video artefact is about feeling engaged with their lecturer (West and Turner, 2016; Crook et al., 2012) because video facilitates the interactions between non-verbal and verbal communication (Eaves and Leathers, 2017). Otherwise, negative emotions such as isolation caused by the lack of interactions in

distance learning can negatively affect the student-lecturer relationships and therefore, their OSO (Alharbi et al., 2017). Hence, lecturers' online presence through the video artefact in OSCE feedback can enhance the nursing students' emotional connections on their placement periods with lecturers. Correspondingly, two student comments are indicative for its benefits in nursing studies:

(UGS-ESOL8): *"Video feels more human. I find the audio more confusing because I can't see the lecturer or what I should be doing".*

Therefore, the students often describe the video artefact as being conversational, supportive, motivational, and as having a sense of closeness through direct expressions (Lamey, 2015; Borup et al., 2014). Additionally, lecturers' body language, posture, gesture, and tone of voice relate to characteristics of "human" for engagement, communication, easier to understand and personalisation in the video artefact compared to online-written and audio artefacts in SAF as:

(UGS2*):"the video aimed at you. It feels like more personal. They are really assessing your work, rather than just ticking the boxes. The lecturer was very calm on the video when she was talking so I felt very relaxed".*

On the other hand, such engagement through video can also cause an initial anxiety about receiving any negative SAF comments

(Henderson and Phillips, 2014). The following student comment is indicative of this:

(PGS6): "*While watching the video, I felt you engage with the person more. The first time I watched the video, I felt a bit nervous, oh gosh the lecturer is talking about me. It felt weird. I have watched it a few times. I think I appreciated it more the second viewing*".

Next, notably the student's perceptions for the use of audio artefacts in SAF concerning providing more information are much lower than other artefacts in the School. On the contrary, for the similar OSCE feedback activity, Harrison et al. (2015) report audio artefacts to be more popular amongst students for understanding their strengths and weaknesses in comparison to online-written artefacts. Besides, although audio can be more comprehensive and motivational than online-written artefacts in SAF activities (Knauf, 2016; Westwater-Wood and Moore, 2016), all students in the School consistently find the audio in OSCE feedback to be less informative and comprehensive due to a lack of visual representations:

(UGS2): "*I was more focusing on the voice on the audio and try to understand the points were crucial for me. I did prefer the video though because I felt like I'd like to see the person*".

Additionally, regarding dyslexia, the student felt that "*Video was quite nice because you can see the lecturer reactions, but audio was ok too*". Hence, although audio feedback in SAF can still contribute to developing an inclusive nursing education (Knauf, 2016), it was their least popular choice when related to their preferred learning styles, such as visual or written text (i.e. solitary and intrapersonal) (Gould and Day, 2013).

6.6.1.9. Mobile Learning Goal

The mobile learning goal involves students taking ownership through control of time, pace, space, portability, device, and interface with different MMAs in the OSCE feedback (Ada, 2018). The mobile learning goal for all MMAs in SAF (Table 6.14) achieves the second highest score (average mean value =4.02), following the ease of access goal (average mean value=4.11) in the School. However, mobile learning with the online-written artefact ($\bar{X}_W$ =4.16) is still higher than video ($\bar{X}_V$ =4.01) and audio ($\bar{X}_A$ =3.90) in SAF in the School.

During the post-intervention test conditions, as all participants were on their two-month practice placement period, they accessed their SAF with MMAs outwith the university premises. To avoid any technical issues for accessing different MMAs through mobile devices and software, the most common multimedia formats are used.

Similarly, all students confirm SAF with different MMAs to be accessible on their personal devices:

(UGS1): "*It was all very easy to access*".

Moreover, they confirm accessing their SAF with different mobile devices:

(PGS6): *"It was on my phone".*

(PGS7): *"It was actually my iPad".*

Nevertheless, as a limitation, audio and video artefacts in SAF require the students to have personal (physical) spaces to listen to these MMAs in OSCE feedback due to their personalised and confidential nature by:

(PGS5): "*I was at work when I got the feedback. So, I used the work computer. I had to use headphones to listen audio and video feedback at work. I didn't want my colleagues to hear my feedback*".

Furthermore, mobile learning allows them to engage with the use of different MMAs in SAF through portability as:

(UGS3): "*I always scan the written text very fast on my phone, but with the video actually I don't need to sit down. I was watching it while I was lying down. So, I found more enjoyable*".

Some also mention disadvantages of accessing online-written SAF via their mobile telephones for interacting with the interface (Ada, 2018) as:

(UGS1): "*Mobile learning is something that I don't necessarily pay attention as long as I get feedback through my computer. You can check it on your phone, but I was very conscious of looking at it properly on my laptop at home where I can read it properly. I could read some of the comments but I couldn't really see all of it on my phone*".

On the contrary, NHS services do not allow the nursing students to use their own devices in their premises due to patient confidentiality and security concerns. Hence, one ESOL student also identifies easy access of SAF with online-written artefacts as advantageous for review and summary purposes:

(UGS-ESOL4): *"We can't take our computers or phones to watch any video to our placements in NHS. With print out, I can take it with me and quickly review them. I always highlight important parts of my feedback on the print out. You can't do this with audio or video".*

Finally, the ANOVA test results show no statistically significant difference between the students for providing mobile learning with online-written and audio artefacts in SAF to improve their

performance. However, there are differences for video in the School (Table 6.40).

Operation	**Differences**
Independent Variable (Goal):	Q40. Mobile learning
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H13:	Mobile learning has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for mobile learning with video in SAF to improve their performance. "Strongly Agree" group suggests that mobile learning with video in SAF improves their performance. Mean difference is 2,019.
2nd difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for mobile learning with video in SAF to improve their performance. "Undecided" group suggests that mobile learning with video in SAF improves their performance. Mean difference is 1,037.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for mobile learning with video in SAF to improve their performance. "Strongly Agree" group suggests that mobile learning with video in SAF improves their performance. Mean difference is 0,982.
4th difference:	There are statistically significant differences between "Agree" and "Undecided" groups for mobile learning with video in SAF to improve their performance. "Agree" group suggests that mobile learning with video in SAF improves their performance. Mean difference is 0,627.

Table 6.40: H13 Hypothesis, Mobile Learning and Video Artefact

Hence, although the students' initial perceptions about mobile learning through the video artefact in SAF ($\bar{X}_V$ =4.01) is lower than online-written ($\bar{X}_W$ =4.16) in the School, there are also statistically significant differences between these groups about mobile learning with video in SAF to improve their performance.

6.6.1.10. Personalisation Goal

In the pre-test condition, personalisation in SAF with the online-written artefact ($\bar{X}_W$ =3.85) scored higher than video ($\bar{X}_V$ =3.67) and audio ($\bar{X}_A$ =3.40) in the School (Table 6.14). Aligning with the Charter (2018), personalisation of SAF with the online-written artefact is achieved by providing additional links, consistency, and annotations in the School (TELED, 2016). As these personalisation goals inevitably facilitate detailed error corrections with standard inline-comments, annotated comment boxes and additional written summaries, they generally focus on improving students' academic writing style (Hepplestone et al., 2011; Ene and Upton, 2018). Yet, this does not necessarily encourage the lecturers to change their formal writing style in SAF (Phillips et al., 2016). On the contrary, personalisation can be achieved by conversational, informal, richer, motivational, and an individualised nature with positive expressions in audio (Broadbent et al., 2018; Westwater-Wood and Moore, 2016; Cann 2014) and with richer body language and demonstrations in video both visually and aurally (West and Turner,

2016; Henderson and Phillips, 2014; McCarthy, 2015; Lamey, 2015; Borup et al., 2014).

Noticeably, personalisation in SAF with MMAs is the least popular choice over all other goals in student experiences (on average mean value=3.64) in the School (Table 6.14). There are several reasons for such a negative finding in the study:

- In comparison to the online-written artefact ($\bar{X}_W$ =2.79) in SAF, the current familiarity with audio ($\bar{X}_A$ =1.50) and video ($\bar{X}_V$ =1.44) artefacts are significantly lower than online-written amongst students in the School.
- The Charter (2018), with its formal rules favouring the use of online-written artefacts in SAF activities, dominates the current SAF developments. Such detailed error corrections by means of standard inline-comments, annotated comment boxes, and generic written summaries through rubrics are generally aimed towards the standardisation of SAF with the online-written artefact (Phillips et al., 2016) but not necessarily personalisation of SAF.
- Despite recognising the use of online-written and audio artefacts in SAF, the video artefact is still not recognised in the School's community. Conversely, the pre-test survey results indicate that the undergraduate students still prefer the video artefact in SAF more than audio.

- Large cohorts of students (n=800) taking OSCE on a yearly basis in the School can lead the lecturers to prefer the use of online-written artefacts in OSCE feedback for its automated functions with pre-defined written comments in the GradeMark™ system, and hence preventing them from providing personalised SAF (Westwater-Wood and Moore, 2016; Voelkel and Mello, 2014). On the contrary, personalisation can be achieved with audio (Cann, 2014) and video artefacts (McCarthy, 2015). Therefore, training lecturers and students for the use of different MMAs in SAF is necessary in the School.

Consequently, during the post-intervention test conditions, the students consistently mention the personalised nature of the video artefact in OSCE feedback compared to the online-written artefact by highlighting the video for being supportive, motivational, conversational, and individualised with a one-to-one nature. While detailed error corrections by means of standard inline-comments, annotated comment boxes, and generic written summaries provide standardisation of OSCE feedback, the impact of such standardisation on students has become obvious with the students' descriptions of online-written artefacts being criticised through rather than motivational, supportive, conversational and being human in video artefacts. For instance:

(UGS2): "*When you read things on the text, yes you take it in a little bit more but I felt that text seems to have a bit generic*

responses. But with video, it aimed at you and feels more personal like they are really assessing your work, rather than just ticking the boxes… My video was very motivational. More like support than criticisms".

(UGS-ESOL8): "*My lecturer was very nice to me on the video. We don't always get a chance to talk to our lecturers. I felt my lecturer was talking to me and nobody was disturbing her to ask other questions*".

To overcome standardisation concerns for the online-written artefact in OSCE feedback, the informal and conversational nature of communication through mediating audio (Broadbent et al., 2018) and video (Lamey, 2015) are consistently mentioned:

(UGS3): "*Video was more personal than written text. I think the written one was very cold or I should say formal*".

Furthermore, the individualised visual demonstrations and one-to-one nature with direct expressions in video artefacts (Henderson and Phillips, 2014; McCarthy 2015) as opposed to directing students to other resources via links in online-written text (Venable et al., 2012) is also recognised:

(UGS-ESOL4): "*In the video, the lecturer mentioned my name several times, and at the end, she summarised the important points for me and showed the correct way of doing it*".

As opposed to both Harrison et al.'s (2014) findings about audio artefacts providing better personalisation compared to online-written in OSCE feedback and Hayman's (2018) audio artefact being more detailed, personable, and concised; its limitation came from lacking of visual clues for its personalisation as:

(UGS1): "*Audio didn't feel quite as precise and concrete so it was a bit more sort of chatty. Not sure, it's difficult to follow*".

Although both high volume in student numbers (Westwater-Wood and Moore, 2016) and additional workload requirements for the video artefact production (Lamey, 2015; Marriot and Teoh, 2012) remain an issue for OSCE feedback in the School, some students' recognise these issues as the School's attempt to increase engagement and OSO through personalisation:

(PGS6): "*Reading feedback was ok, but while I was watching the video, I felt I engage with the person more. It feels like they took more time to prepare that and so it felt more personal*".

Regarding dyslexia, the student argues for benefits of accessibility and inclusiveness for social participation with video in the School:

(UGS10-Dylexic): "*Personalisation with video was quite nice because you can see their reactions. When you go to university, there is a perception that you are on your own. But if you get something tailored to you, then someone has taken the time to design something just for you*".

Finally, the ANOVA test results indicate no statistically significant difference between students for personalisation with online-written and audio artefacts in SAF. However, there are differences for video in SAF (Table 6.41).

Operation	**Differences**
Independent Variable (Goal):	Q42. Personalisation
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H15:	Personalisation has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Undecided" and "Disagree" groups for personalisation with video in SAF to improve their performance. "Undecided" group suggests that personalisation with video in SAF improves their performance. Mean difference is 1,673.
2nd difference:	There are statistically significant differences between "Agree" and "Disagree" groups for personalisation with video in SAF to improve their performance. "Agree" group suggests that personalisation with video in SAF improves their performance. Mean difference is 1,450.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for personalisation with video in SAF to improve their performance. "Strongly Agree" group suggests that personalisation with video in SAF improves their performance. Mean difference is 2,175.

4th difference:	There are statistically significant differences between "Strongly Agree" and "Agree" groups for personalisation with video in SAF to improve their performance. "Strongly Agree" group suggests that personalisation with video in SAF improves their performance. Mean difference is 0,725.

Table 6.41: H15 Hypothesis, Personalisation and Video Artefact

Hence, although personalisation through the online-written artefact ($\bar{X}_W$ =3.85) in SAF is higher than video ($\bar{X}_V$ =3.67), there are still statistically significant differences between groups for video in the School. However, when their familiarity increases in the post-test conditions, their positive views on personalisation with mediating video artefacts in SAF become apparent.

6.6.1.11. Professionalism Goal

In the pre-intervention condition, the students find SAF with the online-written artefact ($\bar{X}_W$ =4.17) more professional than video ($\bar{X}_V$ =3.44) and audio ($\bar{X}_A$ =3.40) artefacts in the School. Noticeably, the professionalism goal for the online-written artefact in SAF is the second highest score following its usefulness ($\bar{X}_W$ =4.39). Inevitably, this result can be associated with formality, standardisation, and detailed analysis with annotations in SAF with the online-written artefact (Reed et al., 2015; Watkins et al., 2014). Additionally, the SAF rules in the School community are extensively focused on the content, structure, writing style, and academic writing style within online-written assignments (Assessment Charter, 2018). By

contrast, during post-test conditions, the professionalism goal in OSCE feedback with the video artefact is often related to the usefulness goal through its contextualisation by the students:

(UGS1): *"I think all three formats were very professional but I definitely see how video feedback in skills module is making it more professional and effective. If the feedback was about how to dress a wound, then they can show you where you did wrong on the video feedback so that you know what you did wrong".*

Moreover, the students imply the professionalism goal as the School's new attempt for increasing engagement in its community by:

(UGS1): *"With different formats, it looks like the School is more progressive in nursing education. I think they were trying to see which one suits us".*

(UGS-ESOL8): *"I think it is professional because I have never received any video or audio feedback for my assignments before. Most of our module materials were in text format. When I received the video and audio feedback from my lecturer, it felt like that they are trying something new for me".*

By contrast, ESOL groups can still link the professionalism goal to its usefulness through self-management as:

(UGS-ESOL4): *"I think written text format are very professional because I can print it too".*

Furthermore, as well as the tone of lecturers' voice in audio, the auditory and visual modalities in video are useful for highlighting the importance of specific comments in SAF (Lamey, 2015). Yet, to provide a hierarchal structure in the comments, the School's SAF tool (Turnitin™) provides the use of text formatting tools for the online-written artefact. However, these functions have an effect on students about how they perceive such communications and its professionalism through consistency in layout and accessibility as:

(PGS5): "W*e get the written feedback in all sorts of format, size and colours. I think there should be a standard size and colour*".

Meanwhile, as the School's e-learning team supported the video and audio technical production under the intervention conditions, the students did not report any technical quality issues for its accessibility. Yet, such multimedia developments requiring additional support, staff time, location, and equipment availability can make it less efficient in SAF production (Westwater-Wood and Moore, 2016; Richard, 2016) and thus, lower technical production quality is also proposed for utilising the video artefact in SAF (Lamey, 2015). Nonetheless, the students mention the importance of high quality multimedia production as:

(UGSC1): "*If the video is recorded with high quality, I think it will look like very professional*".

Next, some students mention importance of lecturers' attitudes and body language in video artefacts for their interpretations of professionalism (Thibaut and Curwood, 2018; Lamey, 2015) as:

(UGS3): "*It was more fun to learn this way. The lecturer was very firm and professional on the video too*".

Lastly, participation and widening access through the accessibility regulations in the School for its professionalism goal is also highlighted:

(UGS10-Dylexia): "*Multimedia is something extra that the university provides. So, somebody with learning difficulties or someone who likes this extra contact, it shows that they are putting in the effort*".

Finally, the ANOVA test results show no statistically significant differences between students for professionalism with online-written and audio artefacts in SAF to improve their performance in the School. However, there is difference for the video artefact (Table 6.42).

Operation	**Differences**
Independent Variable (Goal):	Q41. Professionalism
Dependent Variable:	Q15. My performance could be improved with the use of video artefact in SAF.
H14:	Professionalism has an effect on improving their performance with video artefact in SAF.
1st difference:	There are statistically significant differences between "Agree" and "Disagree" groups for professionalism with video in SAF to improve their performance. "Agree" group suggests that professionalism with video in SAF improves their performance. Mean difference is 1,578.
2nd difference:	There are statistically significant differences between "Agree" and "Undecided" groups for professionalism with video in SAF to improve their performance. "Agree" group suggests that professionalism with video in SAF improves their performance. Mean difference is 0,500.
3rd difference:	There are statistically significant differences between "Strongly Agree" and "Disagree" groups for professionalism with video in SAF to improve their performance. "Strongly Agree" group suggests that professionalism with video in SAF improves their performance. Mean difference is 2,023.
4th difference:	There are statistically significant differences between "Strongly Agree" and "Undecided" groups for professionalism with video in SAF to improve their performance. "Strongly Agree" group suggests that professionalism with video in SAF improves their performance. Mean difference is 0,945.

Table 6.42: H14 Hypothesis, Professionalism and Video Artefact

Hence, although professionalism through online-written artefact ($\bar{X}_w$ =4.17) in SAF is more important to increase students' satisfaction

compared to video ($\bar{X}_V$ =3.44) and audio ($\bar{X}_A$ =3.40), there are still statistically significant differences between groups about video artefacts in the School. The post-test interviews show that as their familiarity increases with video artefacts in OSCE feedback, their positive views on its professionalism goal for video are improved.

6.7. Overview and Conclusions in OSCE Feedback with Different MMAs from Student Perspectives

During the post-intervention interviews, many students suggest that the actual use of video artefacts in OSCE feedback has positively changed their learning experience with regards to the effectiveness, efficiency, and transformation motives and their OSO. To answer the second research question (SRQ2), the goals under these motives are used to summarise weaknesses and strengths of MMAs in OSCE feedback.

- **Familiarity**

Some students do not access their SAF with MMAs due to their lack of familiarity with the School's SAF system and prioritising their grades over SAF.

Familiarity with audio artefacts in SAF was much lower than online-written in the School. Besides, the Charter does not recognise the video artefact. During the post-intervention test conditions, as their familiarity with different MMAs in OSCE feedback increase, their learning experiences, and OSO for the use of video artefact in OSCE

feedback becomes generally positive, but the audio is consistently the least preferred choice under all motives.

Although the School's rules do not define any length of SAF, the lecturers provide longer feedback with video artefacts compared to audio. Nevertheless, the students often prefer these video artefacts in OSCE feedback to audio.

- **Usefulness**

Defined by rules of the Charter, contextualisation of SAF with MMAs for its usefulness goal includes both differences between 'feedback' and 'feedforward' concepts, and comparing SAF for OSCE and essay types of assignment contexts.

During the post-intervention interviews, the video artefact in OSCE feedback is mostly useful for being visual, motivational, providing better summaries, being engaging and conversational by becoming more suitable for the feedforward concept. However, some students argue that the online-written artefacts can be beneficial to provide more detailed SAF responses in written essays for revisions and reviews. Additionally, usefulness of MMAs is also connected to allowing self-management of OSCE feedback. Yet, there is a tension between timing of SAF and publishing the final grades, due to the SAF system delivering the final grades before reading the SAF. This results in some considering their grade to be more important than the OSCE feedback.

Although faster to learn, easy access, easier to remember and paying more attention goals are higher than usefulness goals with the video artefact in SAF in the School, the findings in the post-intervention tests often suggest that the video artefact in OSCE feedback is more useful for being visual, engaging, and providing better summaries.

Although this study aims to compare different MMAs in an OSCE feedback context, some students recognise the usefulness of each MMA to provide different learning experiences and OSO, and hence, suggest receiving all three artefacts together in OSCE feedback.

- **Faster to learn**

Although both volume in verbal communications are higher in video and audio artefacts than online-written text, many students feel that it is faster to learn with the video artefact in OSCE feedback through visual demonstrations, conversational, motivational, and wider summaries with important points. However, there is a risk of ESOL students finding it more difficult to understand the speed and various accents in audio and video feedback.

- **Clarity**

Despite initial perceptions about clarity of video artefacts in SAF being lower than online-written in the School, the students suggest that the actual use of video in OSCE feedback often provides more clarity by facilitating summaries and highlighting important points

with aural and visual clues for their hierarchy than online-written text. However, despite the tone of lecturers providing more clues, a lack of visual clues and demonstrations in audio is an issue with OSCE feedback by becoming their least preferred choice as similar to earlier findings in the School-wide survey.

- **Ease of access**

Although previous findings suggest that the online-written artefact in SAF is easier to access, the post-intervention interviews show that all MMAs in OSCE feedback are easy to access remotely. While the online-written artefact is easier to skim through the text, the lack of markers on the audio artefact for revisions and reviews is an issue.

- **Easier to remember, paying more attention and providing more information**

Although the students are least familiar with the video artefacts in SAF, the School-wide survey shows that the use of video in SAF is faster to learn, easier to remember, paying more attention and providing more information than online-written and audio artefacts in SAF. Moreover, the post-intervention test interviews indicate that the benefit of visual demonstrations, lecturers' online presence with emotional connections, focus, and directness with both voice and body language for pointers/markers is often highlighted in OSCE feedback. Henceforth, their positive views on these four goals with video artefacts in SAF activities have stayed the same. Paying more

attention to the dialogue, both auditory and visual modalities providing more information, informality with its directness and individualised nature, motivational, personal, engaging with its realness (being human), and visual demonstrations are often mentioned in OSCE feedback.

- **Personalisation**

The personalisation goal in SAF with video artefacts is the least popular goal in the School-wide survey. Besides, personalisation in SAF with the online-written artefact in SAF is much lower than its usefulness professionalism and clarity. On the contrary, during the post-intervention test conditions, they consistently value the personalised nature of video in OSCE feedback compared to online-written and audio artefacts by being engaging, informal, conversational, supportive, motivational, demonstrations with direct expressions, "being in there" with lecturers' visual appearance, and individualised one-to-one nature.

- **Professionalism and Mobile learning**

Professionalism and mobile learning for online-written artefacts in SAF are the highest scoring goals under the transformation motive. Therefore, SAF with online-written artefacts are often associated with the formality, standardisation, and detailed analysis with annotations in the School. However, these post-test interviews indicate that video artefacts can equally support professionalism and mobile learning goals.

- **Changing student experiences and OSO**

Prior to the interventions, there are more students suggesting the online-written in SAF ($\overline{X}_{WP}$ =4.12) to improve their performances than video ($\overline{X}_{VP}$=3.83) and audio ($\overline{X}_{AP}$=3.73) artefacts in the School (Section 6.2.1.2.). Nonetheless, the ANOVA test concludes that there are only statistically significant differences between groups about:

- Easier to remember goal for the use of all MMAs
- Faster to learn and paying more attention goals for the use of online-written and video artefacts
- Only easier to remember goal for the use of the audio artefacts
- All goals for the use of the video artefacts

Hence, the biggest change in students' experiences and their satisfaction in the School was expected for the video artefact in SAF. Subsequently, a similar positive improvement of OSO is observed for the video artefact in OSCE feedback.

6.8. Technology-Enhanced Teaching: Teaching Experiences of Lecturers

To explore the final research question (SRQ3) about lecturers' opinions of the SAF intervention in the School with its community norms, rules and DoL; two semi-structured interviews are conducted. As producers of OSCE feedback activity, the lecturers' teaching experiences can depend on their familiarity with the use of different MMAs in SAF activities. Therefore, their familiarity can be twofold: receiver of SAF as a student previously and producer of SAF as a lecturer presently. Hence, during the individual interviews, both lecturers reveal that:

(LECT2): "*I haven't used video or audio artefact to provide feedback to the students or to have feedback provided to me as a student before".*

Although the online SAF system allows recording a maximum of three minutes audio, its download option excludes any audio feedback in SAF. There are no editing functions for audio recordings. Besides, it does not allow recording of video feedback. Due to such inefficiencies, the lecturers in the School have avoided the audio and video SAF options. Due to their new experience of producing three MMAs in the same OSCE feedback, their views are often aligned with the students' experiences by recognising different benefits of each MMA as:

(LECT2): *"Having different forms of feedback is particularly helpful for some students".*

However, as this study aims to identify one foremost multimedia type in SAF, the lecturers also underline that:

(LECT2): *"Difficulty for these feedback types is that lecturers don't want to do both because time is limited and so I guess it is the biggest barrier to that*".

When interviewed about the benefit to SAF teaching-learning experiences and student OSO, they suggest that the video artefact in OSCE feedback would be more popular amongst the students through its visual presentations as:

(LECT1): *"Isn't it funny that sometimes seeing is believing really… I can imagine students found the video in OSCE more beneficial than the others but in essay feedback seeing the details is believing".*

Therefore, it becomes apparent that any developments of MMAs in SAF are affected by the rules, DoL, and community elements from lecturers' perspective.

6.8.1. Rules for Lecturers

Firstly, the mandatory use of the online-written artefact in SAF and any further developments of audio or video artefacts in SAF are supported at the School level rather than the University level (Newland and Martin, 2016). Nevertheless, the School's current SAF policy still does not recognise the video artefact in its Assessment

Charter (2018). When these differences in the rules are highlighted, the lecturers reinforce that:

(LECT1): "*It is probably good to challenge the status quo in the school and to push forward. And some things will work and some things will not. Bear in mind we are not all the same. It is part of our role to push boundaries and to try new ways of working*".

Secondly, as these different MMA activities can change the SAF rules in the School, the lecturers identify a need for additional guidelines about providing consistency in SAF content for the production of MMAs because these activities expose their various skill sets, teaching philosophies and pedagogic approaches in the School:

(LECT2): "*What I find really difficult with camera is that there is nobody there for me to make eye contact with. So you have to certainly act. I wonder what the differences are across module teams to provide feedback. I think some of it depends on people's teaching philosophies and their approach to students in general too*".

While visual appearance is not a concern for audio, their unfamiliarity with audio and video artefacts can still cause some lecturers to become apprehensive (Cann, 2014; Broadbent et al., 2018) because automated generic comments in online-written artefacts do not essentially force the lecturers to change

communication styles through its standardisation (Phillips et al., 2016). Hence, the lecturers' various teaching-learning philosophies and their approaches to students are apparent in SAF with MMAs as:

(LECT1): *"Some lecturers are really engaged with e-learning and the others avoid it with all costs".*

Thirdly, when issues on professionalism, inconsistency in length and layout of SAF in different modules, and students with 'fail' grade receiving higher volume of SAF are mentioned, the lecturers suggest a need for guidelines being produced from both lecturer and student perspectives in the School:

(LECT2): *"It is important SAF is given in a consistent manner for the use of all MMAs. So, there needs to be more guidance around what works for students but also from the perspective of academic staff giving some practical hints and tips. Otherwise, it can make it seem false reflecting on the students' satisfaction results".*

Subsequently, although personalised video artefacts can cause an initial anxiety for receiving any negative SAF amongst students (Henderson and Phillips, 2014), the lecturer still mentions the benefits of seeing lecturers' reactions as:

(LECT1): "*Even if you have underperformed, I think video would be much less aggressive perhaps or more comforting to see that your lecturer was still quite supportive. I suppose a level of detail in it. I would have appreciated that I think rather than a flat written word*".

As well as body language, tone of the voice, and lesser negative emotional words (McCarthy, 2015; Lamey, 2015; Broadbent et al., 2018), the audio and video artefacts can create a sense of closeness through direct expressions, engaging with its realness, and motivational compared to online-written text. These views are often supported by students as "*written one was very cold or I should say formal*" and "*the video felt like human*" in this study.

Fourthly, in comparison to audio and video artefacts in SAF, producing online-written artefacts give them more control for review and edits by:

(LECT2): *"I think my feedback would read much better in essays, if I am taking the time to actually type, read back and then I usually reword something. The time and thought that goes into that possibly might come across as being more professional than just talking. You can't take the words back as you speak".*

However, there are also contradictory views about clarity for SAF content within different MMAs, as their use can require different pedagogic approaches to teaching-learning as:

(LECT1): "*You can misinterpret written words or same as an email to you. There is a different tool or an undercurrent to the written words so I think audio and video are much more expressive. I probably said more in audio and video than I had online-written in the feedback because I can do it faster".*

Similarly, audio and video artefacts are often seen as beneficial for producing higher volume, wider summaries for key points, and additional demonstrations with aural/visual clues (McCarthy, 2015; Cann, 2014).

Furthermore, although audio can become engaging, motivational and personalised in OSCE feedback (Harrison et al., 2015), the lecturers' views on missing visual clues in audio artefacts are also aligned with the students' views as their least preferred choice:

(LECT1): "*If it is only audio, then it is about your pitch. Some people are very monotone. So if you're relying audio, then the lecturer has to be quite animated. Otherwise, it would be quite flat and boring to listen to…For example, if we're telling them that their technique wasn't right, then they're trying to imagine the particular technique to see what I was meaning. When I show them at the same time in video then they don't need to go back and take it further. But again you motivate them to go and do that with audio".*

Hence, each MMA in SAF requires different pedagogic rules. Additionally, one lecturer underlines the pedagogic differences between secondary and HE systems by:

(LECT2): "*Understanding of SAF when the students come to university is important. They might have had more formative feedback throughout their schooling. So, this type and level of SAF are potentially much greater than they had. I think they would pay*

attention to all type of feedback. In case of multimedia, they would pay even more attention because it will be the first time that they get higher volume and multimedia together."

Hence, the novelty factor of different MMAs in SAF (West and Turner, 2016) and the School's Assessment Charter recognising audio compared to video can be linked to the only statistically significant fact about "*first-year undergraduate students preferring audio artefact to second-year undergraduates in the School*" (Table 6.20). However, although paying attention to all types of feedback indicates students' receptiveness (Doan, 2013), due to unfamiliarity with SAF systems and prioritising their grades, there are also similar contradictory student comments about their receptiveness in the School. Yet, current SAF systems do not provide advanced analytics to monitor SAF activities. Moreover, the lecturers reveal the curriculum structure in the School affecting the use of different MMAs in SAF activities by:

(LECT1): "*Their interest might also depend whether they are on a course or studying a standalone module. If it is a standalone and they pass it, then that is the end of their journey. But for the others in this course they want to develop themselves".*

Next, the efficiency motive in producing SAF activities with MMAs can equally play a role from lecturers' perspectives. For example, not aligning with Cann's (2014) findings about audio feedback,

Henderson and Phillips (2014); Lamey (2015); Turner and West (2013); Crook et al.'s (2012) findings suggest video feedback being more efficient in larger cohorts in essay type summative assessment feedback compared to online-written artefact. However, the lecturers mention the time and workload requirements due to their needs for producing written notes to easily remember the SAF content during producing these audio and video artefacts in the OSCE feedback activity. Although essay type assessments produce online-written artefacts for marking and reviews, any observation-based nature of OSCE feedback activities inevitably rely on either lecturer's memory on the day or their written notes taken during the observations. Therefore, the benefits of having their written notes are recognised during audio and video recordings in SAF as:

(LECT1): "*It is about remembering what you have said or not said. There is a skill in that whereas if it is written down, you have written it. You're happy to read it. If you're just rewording it in your own video and audio then you need to remember what you have or what you haven't said*".

Although online-written artefacts in SAF can have a risk of restricting SAF and student engagement by being limited to margins of essays or rubrics through standardisation attempts of annotated feedback (Phillips et al., 2016; Broadbent et al., 2018), the lecturers are still unsure about the suitability of audio and video artefact in essay type summative assessment feedback as:

(LECT1): "*I think different multimedia formats would work quite well for them in OSCE feedback. But I am less clear about how well that would work for other modules submitting essays".*

As SAF activities with online-written artefacts are strongly linked to its clarity, personalisation, and usefulness goals in the School, the lecturers' comments are aligning with the student views about a need for contextualisation of different assessment types in the School. However, their views of providing clarity, personalisation and usefulness are not necessarily aligning with video artefacts (Hall et al., 2016; West and Turner, 2016; Henderson and Phillips, 2014; McCarthy, 2015; Lamey 2015; Borup et al., 2014; Marriot and Teoh, 2012; Crook et al., 2012) and about audio artefacts (Hayman, 2018; Zimbardi et al., 2017; Westwater-Wood and Moore, 2016; Voelkel and Mello, 2014) in essay types of summative assessment feedback.

6.8.2. Norms in the School's Community

The lecturers recognise the importance of the transformation motive in TEL (i.e. mobile learning, professionalism, and personalisation) to promote the School and reach wider nursing communities as:

(LECT1): "*There are some students finding the new way of doing things with technology very interesting. There is something why we keep buying new mobile phones. It isn't that the stuff's broken, it's because they want a new model. So there is something very sassy*

about new technology. And if you're trying to imagine yourself as cutting edge and reaching rural healthcare areas, then technology is a big thing on that".

Furthermore, the lecturers also recognise the diversity in student populations as:

(LECT2): *"Having different forms of feedback is particularly helpful for some students, for those struggling with dyslexia and for ESOL students. Equally, distance learning students might require video discussions more than first-years".*

Notably, all postgraduate courses are distance-learning students in the School. However, the ANOVA test results (Table 6.19) conclude that there are no statistically significant differences for the use of online-written and video artefacts in SAF between different levels of study in the School. Besides, in the post-intervention test conditions, there is a strong preference for the video artefact in OSCE feedback amongst all levels of study. Therefore, this indicates a tension within the lecturers' perceptions about first-year undergraduate and postgraduate student choices.

Finally, the lecturers address changing culture in the student community for the use of different MMAs in teaching-learning activities in the School by:

(LECT1): *"If they had the video they could watch it and they really just have to hit the button. I think the way the world is these days.*

You can see that in your course analytics when you look at whether they have read a topic or watched something. Nine times out of ten, they watch things more often than read them".

6.8.3. Division of Labour (DoL) for Lecturers

High quality multimedia productions require DoL for additional support needs, staff time, location, training requirements, equipment availability in HE (Westwater-Wood and Moore, 2016; Richard, 2016). Additionally, some students relate high quality multimedia productions in SAF to its professionalism goal. Subsequently, such DoL can further provide quality control by:

(LECT2): "*Our feedback with multimedia was edited which gave us some assurances, more than doing OSCE feedback almost instantly. In my case, I have recorded the same feedback several times until I felt it was perfect".*

By contrast, alternative approaches are proposed due to mobile device capabilities as:

(LECT1): *"If you have an iPad, it would produce really good quality videos. It doesn't have to be an expensive video camera that you need somebody else to set it up and all the rest of it".*

Similarly, despite a less technical multimedia production quality in SAF becoming acceptable (Lamey, 2015), any operational issues (e.g. lack of individual room allocations, cost of mobile devices) must be resolved for larger cohort numbers in OSCE feedback

activities. Yet, any training needs for mobile devices, cost, and multimedia editing software are necessary in the School.

Secondly, to avoid any video editing processes, the current SAF system (GradeMark^{TM}) combining online-written and audio artefacts are mentioned:

(LECT2): *"That is just thinking about how I mark and which tools I am using. GradeMark tool is fantastic at pinpointing specific things at the area, rather than just one whole piece of feedback at the end. Obviously we have got the facility to be recording audio feedback within GradeMark too".*

However, despite such alignment with both the Charter (2018) and current SAF software design concepts by avoiding video artefacts in SAF, the student comments indicate that the lack of visual clues, markers (pointers) for review and physical presence of lecturers in audio artefacts are often an issue. Besides, the benefits of audio or video in SAF are already apparent when used as a replacement rather than a supplement to written feedback (Parton et al., 2010; Cann, 2014, Broadbent et al., 2018). Moreover, allowing only a maximum of three-minute recordings for audio feedback, the software tool becomes a barrier in the School because the two lecturers provide audio feedback longer than three minutes on average during the intervention conditions in the study.

6.8.4. Overview and Conclusions of Teaching-Enhanced Teaching

Regarding lecturers' opinions of the intervention on SAF in the School community, rules, and DoL, the lecturers suggest that the video artefact in OSCE feedback is more popular amongst the students through its visual presentations. However, they also reveal that there are some tensions about the SAF teaching-learning activities with different MMAs between teaching experiences of lecturers and learning experiences of students in OSCE feedback. For example:

- Lecturers' own familiarity and their preferred presentation style can still affect their decisions for choosing a specific multimedia artefact. In the case of the online-written artefact, the benefit to the lecturer may be to help them produce responses that are more detailed, more time to edit their own sentences in SAF activities and standardisation. However, the video artefact in OSCE feedback provides additional demonstrations, engagement with emotional connections, focusing on important points with wider summaries, and directness with both voice and body language compared to online-written and audio artefacts. In the study, it should be also recognised that the term "familiarity" is used for influencing lecturers' usage of MMAs. Different academic groups in HE could have varying angles and definitions about

familiarity. Hence, such a term could also link to other terms such as MMAs competency or MMAs confidence level in teaching-learning contexts.

- Producing SAF with different MMAs requires different skills and teaching philosophies in the School community. Therefore, the lecturers need additional guidelines about consistency of SAF with different MMAs from both lecturer and student perspectives.
- I aim to identify one foremost MMA type in SAF that positively affects the student-learning experiences and their OSO in the School. However, aligning with the students' comments on each MMA to providing different benefits, the lecturers recognise benefits for receiving different MMAs in OSCE but also underline their reluctance to create all three formats at the same time, as this requires additional time, increasing cost and conflicting with other deadlines in larger cohort numbers.
- Due to the lecturer's own need of producing written notes to aid their memory when using audio and video for OSCE feedback, any attempts to produce audio or video artefacts in OSCE feedback must take into consideration larger cohort numbers and the standard four-week production period in the School.
- Their views about student receptiveness of SAF with different MMAs are varied. They highlight that curriculum design

structure in nursing education can be based on standalone or continuous modules. As OSCE feedback is linked to other modules, they imply that the students would be more receptive to it.

- By aligning with some student views in the School, the lecturers suggest contextualisation of different assessment types is necessary for SAF activities. Although the video artefact provides efficiency, effectiveness and transformations in the observation-based OSCE feedback, there are still contradictory views about the video and audio artefacts in essay type assessment feedback.
- Only allowing a maximum of three-minute recordings for audio feedback in the SAF software tool becomes a source of tension in OSCE feedback because there were two lecturers providing audio feedback longer than three minutes on average during the intervention conditions. Hence, they propose a combination of online-written and audio artefacts in SAF. The lecturers imply that the current online SAF system is already established in the School community and ignores the use of video artefacts in SAF.
- As mobile learning and professionalism goals relating to TEL novelty and new ways to deliver SAF content for student engagement are increasingly recognised in nursing studies,

the video and audio artefacts in OSCE feedback can promote new School teaching-learning activities.

- Although the high quality multimedia productions done by the support services can provide quality assurances for its professionalism and mobile learning, less technical production quality with new mobile devices could become acceptable in SAF. However, training needs for the mobile learning tools, cost, and multimedia editing software are necessary in the School.

7. DISCUSSIONS

7.1. Overview

This chapter addresses findings through a discussion of the motives identified by students and lecturers involved in the study.

In order to extend access to SAF resources through Technology-Enhanced Education, online management of all summative assessment activities relying on online-written artefacts in SAF is adopted as mandatory teaching-learning practice in the School (Ferrell and Gray, 2016; Newland and Martin, 2016). This is followed by standardisation and consistency attempts of SAF through automated functions of pre-defined online-written comments and annotations with its detailed notes, speed, ease of access, academic writing style, formality, consistency in structure, and directness with hyperlinks to online teaching-learning resources (TELED, 2016; Carruthers et al., 2015; Watkins et al., 2014). However, this leads to the lecturers' attempts to link the OSCE feedback with the marking grid to justify the grades and standard instructions for students on what to improve in summative assessments by information transmission, rather than becoming guidance, motivation, and personalisation in the School. Besides, from a student perspective, online-written feedback in SAF does not necessarily translate SAF into effective, efficient, and transformational feedback as constructive and easily understood guidance, motivational and of adequate quantity to be meaningful

(Watkins et al., 2014). Similarly, the School's Assessment Charter (2018) favouring online-written artefacts in various SAF activities dominates these SAF processes and prioritises relevant motives and goals.

The mediating role of audio and video artefacts in facilitating effectiveness, efficiency, and transformation of SAF activities is an emerging concept in the School. The students initially indicate they prefer the online-written artefact in SAF activities for its familiarity, easy access, usefulness, professionalism, mobile learning, clarity, and personalisation goals. Their choices for the video artefact compared to online-written and audio are related to faster to learn, easier to remember, paying more attention and providing more information. However, when all three MMAs in OSCE feedback are introduced, the video artefact in OSCE feedback becomes more effective, efficient, and transformational by changing their learning experiences and OSO.

Significantly, contradicting Hayman (2018), Broadbent et al. (2018), Pearson (2018), Zimbardi et al. (2017), Nemec and Dintzner (2016), Westwater-Wood and Moore (2016), Harrison et al. (2015), McCarthy (2015), Carruthers et al. (2015) Cann (2014), Voelkel and Mello (2014), Chew (2014), and Lunt and Curran's (2010) findings about audio artefacts in SAF activities being concise, clearer, more comprehensive, and engagement with higher quality and quantity; the use of audio artefacts in both SAF activities and

OSCE feedback becomes consistently the least preferred option related to all motives and its goals in the School.

7.2. Addressing receptiveness in TEL

Contradicting Mensink and King's (2019) findings about a large amount of SAF being never accessed through learning analytics, the intervention test groups were very receptive to their SAF with MMAs in the School. Several themes for their receptiveness emerged that are not frequently reported in TEL literature. For example, from lecturers' perspectives, such high rates of collecting OSCE feedback in test groups can be linked to curriculum design. Lecturers imply that nursing students are more receptive to it because the students characterise their OSCE feedback by being integrated to other nursing modules and developmental for their future practices (Bates et. al, 2013). In addition, the students' initial understanding of SAF when they come to university plays a key role in the School. Differences between high school (receiving more formative feedback throughout their schooling) and higher education (receiving more SAF) in their assessment activities can create new and positive teaching-learning experiences for first-year undergraduate students. In fact, the students' comments show that these differences in teaching-learning experiences should be extended to adult learners, ESOL, disability, and postgraduate students in the School. However, some students' comments show that some can prioritise their grades over SAF in the School.

Aligning with TEL novelty factors for different MMAs in SAF (West and Turner, 2016), the students prefer the use of video in OSCE feedback in the study. However, the lecturers' own awareness of different MMAs (i.e. familiarity, needs and their preferred presentation style) can equally lead the students to choose the use of online-written feedback in SAF. Due to the School's SAF system software design, a supplementary approach is proposed by combining online-written and (a maximum three minutes) audio artefacts in SAF. In my view, a replacement approach (e.g. audio-only) in SAF is more effective, efficient and transformational than a supplemental approach (e.g. text-plus-audio) because the single artefact design (e.g. video-only, audio-only) can overcome standardisation and formality concerns with the use of online-written artefacts by changing the nature of SAF (Cann, 2014; Broadbent et al., 2018). Nevertheless, there are also contradictory views on a replacement approach with audio artefacts in SAF to provide higher achievement rates compared to online-written (Lunt and Curran, 2010). In essence, the audio-only artefact in SAF activities including OSCE feedback activities has consistently ranked the least preferred option in the School. Moreover, screen-casting software (combining online-written, audio and video) can be an alternative to utilise various benefits of all MMAs in SAF as a supplementary approach (Mahoney et al., 2018; Marriott and Teoh,

2012). However, due to its technical production process, I consider a screen-casting option to be a video artefact in the study.

Although prioritising final grades is often linked to student culture in HE literature (Henderson and Phillips, 2014), it should equally be connected to the SAF system software design in the School. Currently, the system publishes final grades before the students read their SAF. This leads to a view that the students are expected to access their feedback after learning their final grades. However, integration of student grades into an online-written SAF is a key driver of higher student access (Mensink and King, 2019). Considering the video artefact in this study, the final grade can be easily integrated into video artefacts. In my view, to maximise potentials of SAF teaching-learning experiences through mutual agreement, the system should prioritise SAF by a "watched and agreed" option followed by automatic release of grades. Nevertheless, students' unfamiliarity with the SAF software despite receiving e-learning inductions and additional guidance materials is another issue in the School (Cann, 2014) because effective, efficient and transformational SAF activities involve proactive receivers of feedback to seek and use their feedback (Winstone, 2017).

7.3. Addressing Student Characteristics in TEL

Understanding SAF with MMA activities requires an investigation of relationship between student characteristics and learning experiences in TEL (Kim and Moore, 2005). However, analysing the

relationship for different MMAs in SAF presents often contradictory findings in the HE literature. The School-wide findings indicate no statistically significant differences for different MMAs in SAF between groups of:

- age (Sopina and McNeill, 2015; Harrison et al., 2015; Henderson and Phillips, 2014)
- subjects (nursing/midwifery)
- mode of study (on-campus/blended/e-learning)

However,

- Male students prefer both audio and video in SAF more than female students (McCarthy, 2015).
- There are no statistically significant differences between different levels of study groups (undergraduate/postgraduate) for online-written and video artefacts in SAF but there is for audio artefacts.
- ESOL groups prefer online-written in SAF compared to EFL (Voelkel and Mello (2014) but contradicting results from McCarthy (2015) and Chew (2014)).

These findings are crucial in the study because the interventions are conducted only amongst first-year undergraduate and first-year postgraduate nursing degree students. Therefore, the same intervention is valid for midwifery students in the School. In

addition, all postgraduate courses are distance-learning students in the School.

7.4. Effectiveness of OSCE Feedback with Video in TEL

Video artefacts in OSCE feedback is an untapped potential with its practice-based learning outcomes in nursing education. Despite being least familiar with video in SAF, the students suggest that video artefacts in all SAF activities help them in terms of faster to learn, easier to remember, and paying more attention related to the effectiveness motive than online-written and audio artefacts in the School (Table 6.14). During the post-test interviews, while their positive views on video artefacts stay the same, their views on clarity and usefulness goals of online written artefact in SAF have also changed to more positive experiences for the video in OSCE feedback. This links to lecturers' additional visual demonstrations for its clarity, both auditory and visual modalities providing more information, lecturers' online physical presence for emotional connections ("*The lecturer was very calm on the video when she was talking so I felt very relaxed")* and better wider summaries with important points for its usefulness in the study.

Noticeably, asynchronous video artefacts in SAF can help nursing students pay more attention to SAF through its directness with both their lecturers' voice and body language compared to audio and online-written artefacts (Deeley, 2018; Mahoney et al., 2018). Contradicting Harrison et al.'s (2015) findings for audio in OSCE

feedback, the nursing students suggest that OSCE feedback with video artefacts is more focussed, faster to learn, easier to remember, easily understood with its visual nature for its engagement. In fact, to overcome any negative emotions, isolation caused by inadequate interactions in distance learning and high nursing student numbers (Alharbi et al., 2017), the video artefact in OSCE feedback can support nursing students' engagement with the School through its realness ("*felt human"*) during their practice placement periods as: "*Reading feedback was ok, but while I was watching the video, I felt I engage with the person (lecturer) more. So, it felt more personal*".

By contrast, as the total lengths of audio artefacts in OSCE feedback are shorter than video, a lack of visual structure and descriptions in audio artefacts create confusion through its higher speed for revision and review purposes (McCarthy, 2015; Gould and Day, 2013). Thus, some students still prefer the online-written artefact for making sense of visually presented and detailed comments to match their reading speed compared to audio (Morris and Chikwa, 2016).

7.4.1. Effectiveness of Contextualisation of Different Summative Assessment Types

Despite existing evidences in the literature about benefits of audio and video feedback activities in summative essay type assessment, some students and lecturers suggest in the School that

contextualisation of different summative assessment activities between essay and observational (e.g. OSCE) types is necessary for its SAF. Their views imply that video artefacts in the OSCE SAF activity positively change student learning experiences and satisfaction in the School but this might also depend on the summative assessment activity context and its relevant goals in the teaching-learning process (Hattie and Timperley, 2007).

Unfamiliarity with video and audio artefacts in SAF for different (essay/observational) summative assessment activities can lead nursing students to prefer online-written artefacts in different SAF activities concerning not only its usefulness and clarity related in the effectiveness motive but also its easy access, professionalism, mobile learning goals related in the efficiency and transformation motives in the School (Table 6.14). However, following the actual use of different MMAs in OSCE feedback, the students suggest that all MMAs are easy to access (Pearson, 2018; Cann, 2014), professional (Thibaut and Curwood, 2018; Broadbent et al., 2018; Lamey, 2015) and supporting mobile learning (Ada, 2018).

Subsequently, usefulness and clarity goals for online-written artefacts are often linked to academic rules, formality, consistency, and detailed analysis with annotations in essay type assessment feedback (Reed et al., 2015). Although annotations are useful for referring directly to new resources (Carruthers et al., 2015; Sopina and McNeill, 2015), it has a risk of restricting SAF and student

engagement by being limited to margins of essays or rubrics in the School (Phillips et al., 2016). In addition, some students do not find annotated SAF constructive and are not satisfied with its quality because such standardised, detailed, and additional generic online-written comments do not essentially change lecturers' formal and academic writing styles (Watkins et al., 2014). In fact, by aligning feedforward concepts for its usefulness goal in the School, the mediating role of audio (Hayman, 2018; Zimbardi et al., 2017; Westwater-Wood and Moore, 2016) and video artefacts (Broadbent et al., 2018; Hayman, 2018; Hall et al., 2016; Lamey, 2015; McCarthy, 2015; Cann, 2014; Henderson and Phillips, 2014; Crook et al., 2012) change the nature of SAF by overcoming standardisation concerns with online-written artefacts.

Despite sufficient evidences in the literature, some participants suggest that contextualisation of different assessment types is necessary for the use of different MMAs in SAF in the School. In my view, these norms in the School's community would directly relate to:

- A better understanding of pedagogic feedback and feedforward concepts
- Harmonising the dominating effect of Student Assessment Charter for its mandatory use of online-artefact amongst students and lecturers

- Recognising the current software design weaknesses in the online SAF system
- A need of better understanding of nursing education learning outcomes in each SAF activity and mapping them out to various SAF contexts

7.5. Effectiveness in Technology-Enhanced Teaching

- **Addressing guidelines**

By comparing video and online-written artefacts in the SAF context, Wade (2016, p.126) suggests "*lecturers were able to say more with spoken words in video artefact than online-written words, and so conveyed clearer interpretation of student's intent in SAF*". By contrast, when "being able to say more with spoken words in video artefact" is considered in my study, the overall length of audio artefacts in OSCE feedback are much shorter than video (Section 6.5.1.2). Therefore, such findings can only be related to lecturers' intentions to be able to provide additional demonstrations in OSCE feedback in my study. Thus, the lecturers recognise producing OSCE feedback with different MMAs requires different rules and teaching skill sets including additional guidelines about its consistency in the community. Therefore, their engagement with different pedagogic approaches, training needs and good-practice examples is equally important in the School (Cremonesi et al., 2017; Johnson and Cooke, 2016). Besides, these guidelines must be produced from both lecturer and student perspectives because current familiarity

with presentation structure and styles in their application can vary depending on each MMA, assessment type, teaching style and previous SAF experiences, as well as student characteristics (O'Callaghan et al., 2017).

- **Feedforward concept**

The School's Assessment Charter has a strong influence on the SAF teaching-learning process by actively promoting the use of online-written artefacts, partly mentioning audio and ignoring video in SAF. There are some attempts to use feedforward concepts in online-written artefacts in the School, but such online-written comments often become instructions for students on what to improve in future summative assessments and grades by information transmission in HE (Reimann et al., 2019). However, video in OSCE feedback is more visual, conversational, motivational, informal and less structured, and therefore, more suitable for 'feedforward' comments (Lamey, 2015).

For example, the Charter (2018) highlights the School's pedagogic adaptations as "*Feedback is phrased in constructive ways for strengths and developmental areas*" and then outlines "*Feedforward doesn't mean answers are always provided but students are directed to other resources*" in the School. Nonetheless, such inadequate adoptions of feedforward concepts in SAF with online-written artefacts as guidance have the risk of students misinterpreting or misunderstanding the meaning of feedback as:

"*My video was very motivational. More like support than criticism. Lecturer was really trying to help me; even you know it's the same information*".

In essence, the video in OSCE feedback is more effective by creating a sense of a dialogic approach in a large cohort of nursing students, although an (asynchronous) video artefact has a 'monologic' approach. For instance, additional visual demonstrations (*lecturer was trying to help and showed me*), appearance of lecturers for its realness (*e.g. felt human*), and directness (e.g. *lecturer was talking to me*) can carry out multiple messages with its multimedia richness (auditory and visual modalities) and emotional connections for its effectiveness (Deeley, 2018; Mahoney et al., 2018).

7.6. Efficiency in Technology-Enhanced Education

Students' experiences and lecturers' opinions depend on norms of SAF software system design where teaching-learning processes take place with new instructions and different presentation styles (Broadbent et al., 2018; Rebecca and Tannous 2015). However, monitoring SAF usage through learning analytics currently do not necessarily produce meaningful results to understand student engagement in the School (Ada and Stansfield, 2017). For example, the system records up to only 30 seconds of student access into SAF with an online-written artefact. Yet, any further student activities (i.e. length, time, visited links, or any downloads) cannot

be recorded. It only allows recording a maximum of three minutes audio directly but its SAF download option excludes audio feedback. Besides, there are no editing functions for audio recordings. Moreover, it does not allow recording of any video feedback. Due to such inefficiencies, lecturers in the School avoid the use of audio and video in SAF.

Meanwhile, an analysis of the test group's data indicates differences in length between audio and video artefacts as well as each lecturer in OSCE feedback (Table: 6.31 and 6.32). However, these differences are even bigger amongst pass/fail-grades and undergraduate/postgraduate groups. Although this might be seen as lecturers' attempts to support the fail-grade students by increasing SAF volume, it can negatively affect the OSO by receiving higher volume of feedback and lack of consistency for the others in the School (Carless, 2006). Thus, as different MMAs can sharply increase SAF volume through their speed, balancing differences between MMAs and intentions of supporting fail-grade students by higher SAF volume through these MMAs must be carefully considered in the School.

7.8. Efficiency in TEL

The efficiency motive in TEL includes providing more information and ease of access motives in the study. Despite being least familiar with video artefacts in SAF, the students initially suggest the video artefact in SAF activities (Table 6.14) provides more information in

the School. Following its actual use in OSCE feedback, these trends continue.

Although an online-written artefact in OSCE feedback is more focussed and structured (Lunt and Curran; 2010), it become less substantial and too detailed by error corrections (McCarthy, 2015; Henderson and Phillips, 2014). Notably, the MMAs in OSCE feedback did not include any imagery, animation, or screencasts in the interventions. However, as a social practice for reconstructing multimodality by visual demonstrations, body language and voice (Rowsell and Walsh, 2011), the video artefacts provide more information by feeling engaged with their lecturers (West and Turner 2016; Crook et al., 2012) because video artefacts facilitate the interactions between non-verbal and verbal communication (Eaves and Leathers, 2017).

Contradicting Harrison et al.'s (2015) findings about OSCE feedback, the nursing students suggest in the School that the audio artefact in SAF activities and OSCE feedback do not provide more information. Hence, although audio feedback can still contribute to develop an inclusive nursing education (Knauf, 2016; Westwater-Wood and Moore, 2016), it is the least popular choice when related to their preferred learning styles, including visual or written text (Gould and Day, 2013).

While all participants find different MMAs in OSCE feedback easy to access, this depends on producing these files with the most common multimedia formats (.mp4 and .mp3) in the School. A list of advisory free software tools to access various multimedia files are published in the VLE. Moreover, contradicting Mensink and King's (2019) findings of student access patterns about online feedback that required to download feedback files being scarce, some nursing students confirm downloading the video artefact in OSCE because they consider SAF to be useful as guidance for their future developments aligning with feedforward concepts (Reimann et al., 2019). Interestingly, allowing the download option of audio and video artefacts in OSCE feedback was not mentioned to the students during the intervention conditions.

7.9. Efficiency in Technology-Enhanced Teaching

Despite students' attention diminishing during longer asynchronous video recordings in SAF (Hepplestone et al., 2011), opportunistic views on possible time-efficiency and higher quantity of SAF with audio and video artefacts are often highlighted from the lecturers' perspective (Zimbardi et al., 2017; Nemec and Dintzner, 2016; Hall et al., 2016; Crook et al., 2012). As these arguments about SAF length with MMAs for its dis(advantages) will probably continue in technology-enhanced teaching, it is apparent that the video artefact with its visual demonstrations and multiple representations (quality) rather than its length (quantity) in OSCE feedback provides more

information for students as: "*I wouldn't say SAF with any multimedia were too long or short, but I think I was listening and watching the lecturer, so video feedback had a bigger impact on me*".

7.10. Transformation in TEL

The transformation motive of SAF with MMAs is about better personalisation, professionalism, and increased capacity of mobile learning.

The personalisation goal in SAF activities with video and audio artefacts were initially amongst the least popular choices in the School. Particularly, personalisation with video in SAF activities has the lowest ranking amongst all other video choices. Aligning with the Charter (2018), personalisation of SAF with online-written artefacts is achieved by additional links and annotations in the School (TELED, 2016). Such detailed error corrections with standard inline-comments and generic written summaries concerning rubrics are aimed at standardisation of SAF (Phillips et al., 2016) and improvement of students' academic writing style (Ene and Upton, 2018; Phillips et al., 2016) but not necessarily the personalisation goal of SAF (Westwater-Wood and Moore, 2016; Carruthers et al., 2015; Voelkel and Mello, 2014). However, when the students' familiarity with video artefacts in OSCE feedback increases, their positive views on personalisation in OSCE feedback with video artefacts become apparent. The participants consistently mention

the personalised nature of video artefact in OSCE feedback compared to an online-written artefact by being supportive, motivational, and conversational as: "When you read things *on the text, yes you take it in little bit more but I felt text seems to have generic responses. On the other hand, video aimed at you and feels more personal like they are really assessing your work, rather than just ticking the boxes".*

A higher number of dyslexic students being drawn to people-orientated nursing careers are estimated in the HE population (Major, 2017, p.15). However, negative attitudes from their peers and lecturers towards dyslexic nursing students are often observed (Greaney, 2018, p.6). The dyslexic participant highlights benefits of accessibility and inclusiveness in the School community using a video artefact in SAF activities as "*Video was quite nice because you can see lecturers' reactions. When you go to university, there is a perception that you are on your own. But if you get something tailored to you, that someone has taken the time to design something just for you".*

Although larger cohorts of students taking OSCE and existing workload requirements for video artefact production in SAF is an issue in the School, personalisation with audio (Cann, 2014) and video artefacts (McCarthy, 2015; Lamey, 2015) in larger cohorts can be also achieved as "*We don't always get a chance to talk to our lecturers. I felt my lecturer was talking to me and nobody was*

disturbing her to ask other questions". Contradicting Lunt and Curran's (2010) findings about audio and Lamey (2015) about video artefacts being faster to produce, the lecturers in this study confirm that production of video and audio artefacts in OSCE feedback can take more time due to necessitating additional preparation time (Westwater-Wood and Moore, 2016; Zimbardi et al., 2017).

Furthermore, professionalism and mobile learning goals in SAF with an online-written artefact are amongst the higher scoring goals in the School because the online-written artefact is often associated with formality with academic writing styles, structure, consistency, and standardisation of SAF information transmission for its professionalism (Reed et al., 2015; Watkins et al., 2014; Van der Hulst et al., 2014). However, accessibility issues of receiving online-written SAF in different formats, size, and colours to create structure and emphasis on text is mentioned in the School. Besides, some students highlight the emotional connections with the lecturer's attitudes and body language for their interpretations of professionalism in video artefacts (Thibaut and Curwood, 2018; Lamey, 2015) as "*It was more fun to learn this way. The lecturer was very firm and professional on the video too*".

In fact, the professionalism goal for the video artefact in OSCE feedback leads to improving student engagement with new methods through technology by the students as: "*With different multimedia*

formats, it looks like the School is more progressive in nursing education. I think they were trying to see which one suits us".

Finally, mobile learning allows students to engage with SAF through portability. The students confirm that all MMAs in OSCE feedback provide mobile access. Additionally, they suggest different methods of access through mobile devices to reveal a range of devices owned and used by the nursing student population. Their learning experiences indicate increased use of mobile learning and promote their motivation and satisfaction in nursing education (Lee et al., 2018). Nonetheless, the video artefact in OSCE feedback requires them to have personal (physical) spaces for its privacy due to its personalised nature. Moreover, issues around ownership through control of time, pace, and space for its production with audio and video artefacts are mentioned by the lecturers in the School (Ada, 2018).

7.11. Summary

As student satisfaction and their engagement with formative assessment feedback in nursing courses are much higher than SAF activities (Wing, 2018), it is often prioritised over SAF in HE. However, it is important to remember that teaching-learning experiences in SAF are co-dependent and co-operational processes between lecturers and students. Therefore, the use of different MMAs in SAF affects the student nursing education journey by integrating both formative and SAF experiences for OSO. Thus,

different MMAs concerning SAF effectiveness, efficiency, and transformation motives are equally dependent on their SAF rules, DoL, and norms in the community elements in the School.

As OSCE grades are a predictor for students' future performance in national high-stakes examination results (Pugh et al., 2016), the OSCE feedback must include actionable advice not only on its content but also become motivational in their future developments, encouraging wider areas of concentration and strategies beyond its performance metric (Kulasegaram and Rangachari, 2018). Consequently, the positive findings about the use of video in OSCE feedback indicate a better delivery of effectiveness, efficiency, and transformation motives compared to online-written and audio artefacts in the School. Yet, the list of three motives and eleven goals is by no means exhaustive but it equally shows a kind of range available, and becomes an overview of the possibilities in teaching-learning experiences and OSO.

8. CONCLUSIONS AND FURTHER WORK

This section provides a summary to draw conclusions for the main research question. It also includes its original aims, implications, limitations, and areas for further research.

8.1. Original Aims and Thesis Contribution to Knowledge

My original aim was around understanding nursing students' and lecturers' opinions of different MMAs, before and after the new artefacts intervention, in relation to their teaching-learning experience, SAF effectiveness, efficiency, and transformation motives related to student OSO. As a sequential and exploratory intervention case study, it addresses a gap by providing breadth of understanding about lecturers' and students' experiences from both undergraduate and postgraduate nursing student perspectives, relating to their use of different MMAs in the same SAF activity in the School. The main MMAs are online-written, audio and video. For its interventions, first-year undergraduate and post-graduate nursing students are chosen in a summative OSCE feedback activity. A DBR approach is employed to learn from students and lecturers using these multimedia artefacts to change their experiences and OSO in teaching-learning processes.

Online SAF activities with MMAs depend on an organisational culture with their adoption of various TEL practices. The School's Assessment Charter (2018) favouring online-written artefacts in all

SAF activities, dominates SAF teaching-learning processes by prioritising relevant motives and goals but ignores the video in SAF. Teaching-learning activity in OSCE feedback for the actual use of different MMAs reveals more positive views on video artefacts for teaching and learning experiences in the School.

Firstly, the integrative literature review in the study shows that:

- An online-written artefact is effective, efficient and promotes transformation more than paper-based artefacts.
- Both audio and video artefacts can also provide effectiveness, efficiency, and transformation in SAF activities.
- Audio artefacts provide effectiveness, efficiency, and transformation in OSCE feedback.
- There are often contradictory views about different MMAs in SAF activities in relation to student learning experiences and OSO.

The second review identifies related motives and goals in teaching-learning processes for different MMAs in SAF. Within the scope of the review, three main motives and eleven goals are:

- Effectiveness: familiarity, usefulness, faster to learn, easier to remember, paying more attention, and clarity
- Efficiency: ease of access and providing more information

- Transformation: mobile learning, personalisation and professionalism

Prior to the intervention in test groups, the School's current SAF culture is analysed by a School-wide survey to understand the students' perceptions for different MMAs in SAF activities in relation to their learning experiences and OSO in the School. Meanwhile, both the Charter (2018) and Summative Assessment Marking Guidance for Staff (2018) policies are examined for its rules, community and DoL to understand SAF activities in the teaching-learning culture.

Then, the pre-intervention test design is used to understand students' willingness to use MMAs in SAF activities in pre-intervention groups. Next, the post-intervention test design is aimed to focus on the actual use of MMAs in the same OSCE feedback activity. Finally, these findings are integrated into semi-structured student and lecturer interviews to answer the main research question.

This thesis contributes to knowledge in terms of providing a broad mapping of nursing students' and lecturers' opinions and experiences of different MMAs (online-written, audio and video) in SAF, and how this relates to student satisfaction. It will inform educational technologists, lecturers, and researchers working in the area of TEL and SAF, in particular with regards to the efficiency,

effectiveness, and transformation complexities of MMAs' application, in order to have a better insight when planning and implementing various MMAs in SAF.

8.2. Answering Research Questions

8.2.(SRQ1). Students' Perceptions for MMAs in SAF Activities in the School

Measurement of the current SAF culture by the School-wide survey shows that the students are more familiar with online-written artefacts in SAF activities than audio and video. In addition,

- Although the students prefer online-written artefacts in SAF activities for its easy access, usefulness, professionalism, mobile learning, clarity, and personalisation goals respectively; they still prefer the video artefact for faster to learn, easier to remember, paying more attention, and providing more information goals to an online-written artefact.
- Under the online-written artefact category, faster to learn and paying more attention are its least popular goals.
- Under the video artefact category, usefulness and personalisation are its least popular goals.
- Under all goal categories, the audio artefact is consistently ranked the least popular option despite being more familiar with audio than video in SAF activities. Besides, clarity,

providing more information and personalisation goals are its least popular choices.

Consequently, there are no statistically significant differences between different age, subjects (nursing/midwifery) and modes of study groups for the use of different MMAs in SAF. However,

- Male students prefer both audio and video artefacts in SAF more than female students in the School.
- The ESOL group prefers the online-written in SAF more than the EFL goals.
- There are no statistically significant differences between different levels of study (undergraduate/postgraduate) for online-written and video artefacts.

Meanwhile, the use of different MMAs in SAF has an effect on improving students' OSO through improved performance, but the ANOVA test concludes that there are only statistically significant differences between groups about:

- The easier to remember goal for the use of all MMAs
- The faster to learn and paying more attention goals for the online-written and video artefacts
- All goals for the video artefact

Hence, it is predicted that while "changing student experiences and their satisfaction in SAF" is likely to happen in all goals for video

artefacts in SAF, the least change is likely to occur for the audio artefacts in the School.

Furthermore, the Charter (2018) has a strong influence on SAF teaching-learning culture through its established rules by actively promoting mandatory use of the online-written artefact, partly mentioning the audio artefact, and ignoring the video artefact. This is linked to the online SAF software design with its current norms through its pedagogic adaptations, functions, and delivery method. Established SAF rules (feedback/feedforward with online-written artefact), DoL, student receptiveness, and unfamiliarity with different MMAs in SAF contribute to their choices.

The personalisation goal in SAF activities with video and audio artefacts are amongst the least popular choices in the School. Particularly, personalisation with video in SAF activities has the lowest ranking under its video artefact category. Aligning with the Charter (2018), personalisation of SAF with online-written artefacts is currently achieved by annotations and online-written generic written summaries in the School. Such detailed error corrections with standard inline-comments and online-written summaries concerning rubrics are aimed at standardisation of SAF consistency, justifying final grades, and improvement of students' academic writing style but not necessarily the personalisation goal of SAF. Besides, there are more students suggesting the video artefact in

SAF improves their performance than does audio relating to their OSO.

Finally, during the pre-intervention test survey for rating their willingness to use MMAs in SAF, although almost all postgraduate students are willing to use the video artefact in SAF, the undergraduate first-year students' willingness to use video and audio artefacts are much lower. Such unwillingness depends on their views on contextualisation of different assessment types as well as the School's current teaching-learning culture actively promoting the online-written artefact in SAF.

8.2.(SRQ2). Students' Experiences and Satisfaction for MMAs in OSCE Feedback

Actual use of three different MMAs in the same OSCE feedback activity changes the nursing students' learning experiences through its effectiveness, efficiency, transformation motives, and their OSO. These students generally hold positive views about their experiences for the video artefact compared to online-written and audio artefacts. Evidently, more students explicitly prefer the video and online-written artefacts to audio feedback in OSCE feedback. Subsequently, although personalisation with video in SAF activities has the lowest ranking amongst all other video choices, there is a significant change about personalisation of OSCE feedback with the video artefact positively affecting student experience and OSO.

Despite the fact that the video artefact in OSCE feedback is more popular than online-written and audio, some students address each MMA in OSCE feedback to provide different benefits, and thus, argue for receiving all three MMAs simultaneously in the future. Meanwhile, the ESOL group views, initially preferring the online-written artefact in SAF activities, have improved for the use of video in OSCE feedback. Additionally, the dyslexic student also suggests that the video artefact in OSCE feedback is very beneficial.

An exploration of changing nursing students' learning experiences through eleven goals under its effectiveness, efficiency, transformation motives and their OSO in the School conclude that:

- Unfamiliarity with the SAF rules and online SAF system tool, differences between high school (receiving more formative feedback throughout their schooling) and higher education (receiving more SAF), curriculum design structure in nursing education, and inadequate SAF system design prioritising grades over SAF, can affect student receptiveness of SAF with MMAs.
- The video artefact in OSCE feedback is mostly useful for being personalised in nature, visual, motivational, better summaries, and conversational by aligning with feedforward concepts. Contradicting evidences in the current literature, some students argue a need for contextualisation of different

summative assessment types (e.g. observational OSCE/essays) in SAF activities requiring a specific MMA. Such a finding is linked to an Assessment Charter (2018) which favours the use of an online-written artefact in SAF activities in the School.

- Although the students are least familiar with the use of video in SAF, they suggest the video in SAF is faster to learn, easier to remember, paying more attention and providing more information than any other MMAs. Following its actual use in OSCE feedback, this trend continues. The video artefact facilitates visual demonstrations, online physical presence of lecturers for emotional connections, realness (e.g. felt like human), becoming conversational and motivational, focusing on important points with wider summaries, and directness with both voice and body language compared to online-written and audio artefacts. On the contrary, due to its speed, the audio becomes confusing to follow up the sections the lecturer mentions for review and revision purposes while the online-written artefact is easier to skim through the text.
- Despite opportunistic views on producing higher quantities of SAF with the speed of audio and video artefacts from lecturers' perspectives, the video artefact in OSCE feedback is useful for its visual demonstrations and multiple representations (quality) rather than its length (quantity) for

students as: "*I wouldn't say SAF with any multimedia were too long or short, but I think I was listening and watching the lecturer, so video feedback had a bigger impact on me*".

- Although the online-written artefact in SAF provides more clarity compared to video and audio in the School, the video in OSCE feedback often provides more clarity by facilitating overall summaries and highlighting important points with aural and visual clues for their hierarchy compared to online-written text. However, despite the tone of lecturers providing more clues, a lack of visual cues, structure, and demonstrations in the audio artefact is an issue.
- They consistently value personalised nature of video artefacts in OSCE feedback with its informality, directness, individualised one-to-one nature, realness (being human), and additional demonstrations, "being in there" with lecturers' visual presence compared to online-written and audio. Further, the online artefact has generic and standard comments causing feelings such as "lecturers just ticking the boxes" and "very formal".
- Professionalism also relates to its relevance in OSCE feedback content by improving student engagement through witnessed attempts at new methods and putting the extra effort in

multimedia developments. All MMAs in OSCE feedback are easy to access and provide them mobile access.

8.2.(SRQ3). Teaching Experiences for MMAs in OSCE Feedback, regarding School Community, Rules and DoL

The lecturers suggest that the video artefact in OSCE feedback is more popular amongst the students through its visual presentations, wider summaries, and additional demonstrations by becoming motivational and conversational. However, they reported several difficulties and strengths of their teaching experiences in OSCE feedback with different MMAs. For example:

"Creating three types of MMAs"

Although the lecturers recognise benefits of receiving three MMAs together in the same OSCE feedback for students, they underline their reluctance to create all three formats together because it requires additional time, increasing cost, location requirements, and editing the multimedia files.

"High student numbers"

Due to their needs of additional written notes to aid memory for producing OSCE feedback with video and audio artefacts, any attempts to adopt the use of audio or video artefacts in OSCE feedback must take into consideration larger cohort numbers, editing the multimedia files and four-week standard production period in the School.

"Guidelines about consistency of SAF with different MMAs"

Producing SAF with different MMAs requires various teaching skill sets and pedagogic approaches in the School community. The lecturers identify their need for additional guidelines about consistency of SAF with different MMAs because each MMA in SAF requires a new pedagogic approach. These guidelines should be produced from both lecturer and student perspectives through consistency to increase student OSO.

"Lecturers' familiarity with MMAs"

There are also contradictory views about clarity provided within different MMAs because lecturers' own presentation styles and familiarity with each MMA affects their choices. Online-written artefacts allow more detailed responses and easily amending sentences in SAF by control over the content, time, and location. However, the video artefact in OSCE provides additional demonstrations, engagement with emotional connections, wider summaries, and directness with both voice and body language compared to online-written and audio artefacts.

"Seeing is believing"

Although the audio artefact in OSCE feedback could be engaging and motivational, the lecturers' views on lacking visual clues are often aligned with the student comments as their least preferred choice. The use of video artefacts in OSCE feedback is a common

agreement by providing visual demonstrations, physical presence of their lecturers, including emotional connections for engagement, compared to the online-written artefact.

"Student receptiveness of all SAF"

There are contradictory views between lecturers on students' receptiveness to SAF with MMAs in the School. In fact, unfamiliarity with the online SAF system, prioritising their grades over SAF, curriculum design of nursing education, extensive use of online-written artefacts with generic sentences can affect their receptiveness with SAF.

"Contextualisation of different summative assessment types"

Similar to students' views, there are also contradictory views about whether video and audio artefacts in SAF for essay type assessment are suitable amongst lecturers.

"Online SAF Software"

As a limitation of online SAF software, there are two lecturers providing audio feedback longer than three minutes on average during the intervention conditions. Hence, the lecturers propose a combination of online-written and audio artefacts in SAF. The lecturers believe that the current online SAF system is already established in the School community.

“The way the world is these days”

As mobile learning, professionalism and personalisation goals in TEL are increasingly recognised in nursing communities, the use of video and audio artefacts in OSCE feedback can facilitate the transformation motive compared to online-written artefacts in the School.

8.3. Research Limitations and Further Research Areas

Like any other research, this research has limitations. Due to the little existing knowledge and contradictory findings in the area of SAF with various MMAs, the study is conducted by quantitative methods and descriptive approaches to data. This was in order to provide a broader picture of MMAs in SAF, as a step towards understanding these phenomena. Therefore, I only adopted some elements of CHAT, which were useful to inform my study overall. However, a further depth of understanding could be achieved with different methods in addition to the ones applied such as in-depth interview methods with particular theoretical foci, such as CHAT. Moreover, I applied methods that were testing opinions and experiences. While this was useful, it did not account for all characteristics of the MMAs because further exploration of MMAs affordances and related interactions is also an under-researched area, such as MMA’s multimodal characteristics and affordances. For instance, any multimedia design guidelines for different MMAs in SAF activities would need to be produced minding both lecturer and

student perspectives for its future implementation. Further research could explore these guidelines in the SAF context.

Furthermore, with its case study design approach, the study focuses on a single case (i.e. a School of Nursing and Midwifery) in the context of a particular environment (i.e. Scotland). As a limitation and weaknesses, the single case (as the results in one case and particular environment, e.g. nursing) might be different for different contexts in HE. In the context of this study, low male student numbers in nursing studies creates a weakness in understanding gender-related categorical findings. Additional research could explore nursing male student perspectives as a minority group. Likewise, despite sufficient evidences in the literature, some participants suggest that contextualisation of different assessment types is necessary for the use of different MMAs in SAF in the School. Any further research might focus on different assessment types, such as essay type assessments in the School.

Finally, whilst harnessing various feedback methods with TEL and MMAs, we should not forget about the importance of formative assessment in HE. Although I consider formative and SAF to be two different activities in the study, SAF and formative assessment feedback in HE can become a continuous feedback operation affecting students' experiences in their education journey and OSO in the School.

8.4. Summary

OSCE feedback with video artefacts has an untapped potential to improve students' OSO for nursing teaching-learning experiences in the School. Initially, students indicate that they prefer the use of an online-written artefact in SAF activities for its familiarity, easy access, usefulness, professionalism, mobile learning, clarity, and personalisation goals in the School community. Their choices for a video artefact compared to online-written and audio are concerned with faster to learn, easier to remember, paying more attention and providing more information. However, when all three MMAs are introduced in the same OSCEs feedback activity, the use of video artefact reveals more positive views on effectiveness, efficiency, and transformation of nursing students' teaching-learning experiences and their OSO. The video artefact is considered as useful for being motivational, conversational, visual, giving wider summaries and direct with both its voice and body language, for being faster to learn, easier to remember, paying more attention and providing more information by aligning with feedforward concept. Students interpret this as the School attempts to improve their engagement with new methods for its effectiveness and putting an extra effort in by transforming the SAF activity using the video artefact. The personalised nature of a video artefact in OSCE feedback provides informality, "being in there" by lecturers' visual presence, motivational, realness (being human) through emotional

connections, wider summaries rather than detailed criticism, trying to help with additional demonstrations rather than information transmissions when compared to online-written and audio. On the contrary, as a result of lack of visual clues and demonstrations, the audio artefact is the least preferred choice of SAF and OSCE feedback activities by the students in the School, contradicting current findings in the literature about audio artefacts in various SAF activities providing concise, clearer, more comprehensive, and engaging with higher quality and quantity than the other artefacts.

There are no statistically significant differences between different levels of study (undergraduate/postgraduate), age, subjects (nursing/midwifery) and modes of study (on-campus/blended/e-learning) about SAF with different MMAs in the School. Several students recognise additional benefits of receiving all three MMAs in the same OSCE feedback and continue to receive them in SAF activities. Aligning with the School Assessment Charter (2018), favouring the online-written artefact in SAF activities, some students and lecturers argue for a need of contextualisation of different assessment types (e.g. observational OSCE/essays) for its SAF activities. Consequently, while the lecturers' concerns with high student numbers, receptiveness, lack of standardisation and consistency in SAF with video artefacts, they highlight their needs (i.e. time, space, speed, cost, skill sets), (un)familiarity and lack of guidelines for different MMAs in SAF activities. This indicates a need

for change in the teaching-learning culture relating to SAF rules, DoL, and norms of SAF tool design elements in the School. Nonetheless, the lecturers suggest that the video in OSCE feedback can positively change learning experiences of students and their OSO. In essence, the future effective, efficient and transformational use of the video artefact in SAF activities require a focus on its related goals and resolving these tensions between learning experiences of nursing students and teaching experiences of lecturers in the School.

This study is useful for anyone interested in SAF in digital environments, as well as students and lecturers experiences with different MMAs to support this feedback. It is particularly useful to assessment designers, programme leaders/management, lecturers, and researchers in this area of TEL, and those more generally interested in multimedia artefacts, exploratory and intervention research types.

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10. APPENDIX 1: School-Wide Survey

Part 1.

(Q1.) Age*

16-17() 18-22() 23-27() 28-32() 33-37() 38-42() 43-47() Over 48()

(Q2.) Gender*

Female() Male() Unspecified()

(Q3.) Subject Study*

Nursing() Midwifery()

(Q4.) Level Study*

Undergraduate[First-year() Second-year() Third-year() Honours()] Post-graduate()

(Q5.) Mode Study*

On-campus() Blended() Online-learning()

(Q6.) Is English your first-language*:

Yes() No()

Part 2. Rating your experiences:

A: I am familiar with:	Yes	No	Undecided
(Q7.)**Online-written text** in SAF.			
(Q8.)**Audio** in SAF.			
(Q9.)**Video** in SAF.			

B: I find:	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Q10.)**Online-written text** useful in SAF.					
(Q11.)**Audio** useful in SAF.					
(Q12.)**Video** useful in SAF.					

C: My performance in SAF is improved with:	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Q13.)**Online-written text**					
(Q14.)**Audio**					
(Q15.)**Video**					

D. Online-written text in SAF is helpful for:

Options:	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Q16.)Easy access					
(Q17.)Clarity					

(Q18.)Faster to learn					
(Q19.)Easier to remember					
(Q20.)Providing more information					
(Q21.)Paying more attention					
(Q22.)Mobile learning					
(Q23.)Professionalism					
(Q24.)Personalisation					

E. Audio in SAF is helpful for:

Options:	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Q25.)Easy access					
(Q26.)Clarity					
(Q27.)Faster to learn					
(Q28.)Easier to remember					
(Q29.)Providing more information					

(Q30.)Paying more attention					
(Q31.)Mobile learning					
(Q32.)Professionalism					
(Q33.)Personalisation					

F. Video in SAF is helpful for:

Options:	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Q34.)Easy access					
(Q35.)Clarity					
(Q36.)Faster to learn					
(Q37.)Easier to remember					
(Q38.)Providing more information					
(Q39.)Paying more attention					
(Q40.)Mobile learning					
(Q41.)Professionalism					

(Q42.)Personalisation					

Part 3. Additional comments?