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# An Investigation into the Teacher-student Interaction-Dependency of English for Medical Purposes Comprehension in the Virtual Reality-supported Flipped Classrooms

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*Abstract*—**This study with sequential exploratory study investigated the teachers' coaching in the Virtual Reality Game (VRG)-supported flipped classrooms of teaching and learning English for Medical Purposes (EMP). In so doing, 280 undergraduates at Medical University of Isfahan who took English for Medical Purposes (EMP) in the spring semester of the academic years 2019-2020 were selected, using the design of experiments, to learn comprehension skills. Interview along with the assessment of the students' comprehension skills and performance, were conducted. Analyzing the collected data through a mixed effect linear model, it was revealed that the teacher-coached VRG-supported flipped classrooms facilitated the EMP comprehension process and ushered in students' outperformance, engagement, and teacher caring for students' collaboration for doing VRGs. It was found that comprehension was facilitated in both instructional-learning contexts and fields as the teachers coached the participants to tackle the learning needs in the mixed disciplinary circles. Qualitative analysis that was conducted on data from the interview revealed that the students perceived that active engagement under the coaching of teachers and support of their peers bear the efficiency of the VRG-supported flipped EMP classrooms EMP comprehension skills was enhanced.**

***Keywords—Virtual reality; coaching; EMP; flipped classroom***

## I. INTRODUCTION

Nowadays, effective English for Specific and Academic Purposes (ESAP) comprehension skills can be told as doing with the students' engagement under teachers' coaching in the educational technology (EdTech)-supported wherein real-life scenes has been portrayed in the activities [1]. The conventional teacher-led methods of ESAP teaching were void of teacher-student interaction valency for comprehension and easy applying of what was taught in the instructional-learning classrooms [2]. The pedagogical penetration of gamified activities, for instance, in the language classrooms of non-English higher education, is now high [3] so that the seeming distance between teacher and students has been reduced to an extent which corresponds to teacher availability for coaching. Seely (2019) [4] reports that instantiation of actual-world context has fostered the opportunity for teacher-student interpersonal communication in the situated language learning, and nowadays, immersive ESAP learning is done through students' engagement under coaching surveillance of teachers.

The last two decades has been an extended arena for advancement of actual-life-like ESAP coaching. A large number of students engage in communication with teachers to learn through the scenes of the actual-world fields [5]. Equally, coaching students in the actual-life-like practicum of hybrid ESAP classrooms has led to the development of students' participation in addressing the needs, which allow students to employ their learning in the process of communication for training others with command over the process of learning by teaching [6].

### *A. Coaching flipped ESP classrooms*

Instantiation of actual-world in the hybrid classrooms have become increasingly affordable in enhancing teacher-student interaction and student engagement in the language classrooms of higher education [7]. Besides, these classrooms

have not gone overlooked by higher education stakeholders to establish flipped ESAP classrooms (e.g., [8-10]). The interest in coaching students in the individual indoors and outdoors of the flipped ESAP classrooms arises out of a desire to engage students in cross-contextual instructional-learning environment [11]. These flipped ESAP classrooms have become increasingly associated with Science, Technology, Engineering, and Mathematics (STEM) approach.

On the other hand, despite the simulation-based nature of new games, some language education stakeholders still undervalue the game-assisted activities in enhancing authentic communication between teacher and student. They argue that the scenes of the Commercial-Off-The-Shelf-supported activities are canned imitation of conventional exercises of the textbooks void of true teacher-student interaction and student active engagement [12]. Even so, as games improved and various features added to the new-game-assisted activities, tutoring game-assisted practicum has become more prevalent [13]. Gamified language education can be considered as a tailor-made interdisciplinary process of knowledge building wherein teachers can modify their interaction styles in coaching students [14]. Numerous studies have born testimony to the merits of game-assisted education coached for comprehension [15]. Shokrpour et al. [16] found that Virtual Reality Game (VRG)-supported activities are useful in facilitating students' cognitive comprehension process when English teachers attempted to engage students by addressing their needs using different communication styles in variegated scenes of VRGs. Although the following studies did not directly address VRG-supported ESAP learning, their findings do support the applicability of VRGs for teaching and learning comprehension skills by collaborative presence of students under coaching surveillance of teachers.

### *B. Coaching comprehension skills through gamified activities*

In review of the studies on gamified language education, Chen (2020) [17] realized that the opportunities provided by the scenes of cross-contextual gamified curricula approaches the subjects of authentic interaction and teacher-student bond. Some studies have highlighted the participation of students with coaching in gamified language classrooms [18]. For example, students who were coached in during the gamified language course based on their needs in the interpersonal teacher-student interaction were engaged more actively and achieved significant gains in comprehension skills [19] found that students could improve their comprehension while their teacher coached them and establish interaction in collaborative fulfilling VRGs with their peers in the flipped English classrooms and Knijnik et al. [20] is of the opinion that student readers benefitted from the teacher availability in their interaction with their teacher for doing gamified activities.

VRG-supported language classrooms have made provision for coaching students through authentic learning opportunities in the *Digital Natives'* academic and professional lives, to practice materials with fellow students and visualize the professional contexts [21]. A great part of studies on VRG-supported language education focuses on the benefits of negotiation between teachers in their tutor role for student engagement [22]. This way, VRG-supported language activities which involve teacher and student cooperation [23] can foster rich opportunities for language learning and comprehension provided that the process of fulfilling activities accompanied by the teacher constant coaching for interaction. The cooperation involves student engagement for reading between lines as well [24]. It is this process of coached reading between lines which seems to be of help to the cognitive comprehension process [25]. In addition to dealing with miscomprehension, student engagement in reading between lines of the VRGs' verbal cues has also been depicted as an arena for interaction between teacher and student, underlining the easy comprehension there [26]. Parallel with the diversity of these games, non-English researchers have started to tackle the question of whether the teacher availability in the teacher-student interaction enhances potential uses of VRG-supported language practicum in the ESAP teaching [27]; however, a revisiting of the teacher-student communication in game-based language learning in higher education was needed. Basturkmen [28] reconsidered the extent of teachers' presence in student engagement for learning the materials suggesting teacher availability for communication. Teacher coaching in the new-game-supported ESAP practicum engages students, which may include a reduced distance between teacher and students [29]. Besides, coaches are involved in interactions between students and actual-life beneficiaries, which in turn may results in the beneficiaries' active engagement as well [30]. As far as teaching comprehension skill through VRG-supported practicum is concerned, the tutoring between students and/or students and beneficiaries is hypothesized to be valuable in that it enhances students' active engagement in the learning and comprehension process [31]. Similar benefit can be derived during students' attempt to tackle the real-life-like needs in the scenes of the VRG-supported language activities. When teachers coach students on thinking about using fitting comprehension strategies while practice ESAP listening or reading skills, the students can simultaneously receive augmented materials and engage in an activity, which in turn may promote their ability for doing well in actual-life arenas [32]. Occurring in concert with classroom materials and actual-life needs, this tailor-made nature of coached gamified classrooms, is thought to facilitate psychological comprehension processes [33]. This cognitive affordability of gamified activities can facilitate the process of tackling the actual-life needs [34].

Research that attempted to explore the teachers' tutoring role in interaction with students in the practicum of the flipped language classrooms employed mainly prefabricated activities similar to the hybrid learning method employed the digitalized customary textbook activities. Turan and Akdag-Cimen (2019)

[35] remark, in reviewing the state of research in the flipped classrooms of higher education, these flipped language classrooms have not tackled teacher-student interaction for tackling actual-life needs and what that might represent for the applicability of these teacher as coach-led classrooms in ESAP education. They continue to note that the flipped ESAP classrooms need to gain some understanding of how researchers should capitalize on reducing the perceived distance between teacher and students, to engage student and ease the cognitive comprehension process.

This study aims at meeting Turan and Akdag-Cimen's (2019) [35] concerns by exploring coaching EMP comprehension via VRGs for teaching EMP comprehension skills in the post-reading and listening VRG-supported flipped classrooms, when students and their cohorts from different or similar disciplines in circles have communication with teachers practice the materials before the online instructional-learning session. This study takes a socio-cognitive standpoint in attempting to understand how coaching students can enhance affordances of the VRG-supported flipped classrooms in favor of students' EMP comprehension skills.

Today, new generations of games require a continuing examination of how teachers' availability mediates student active engagement affects language learning and comprehension taking both psychological and social aspects into account. Initially, the teacher availability facilitates students' engagement in teaching and learning process through new gamified activities [36]. Coaching listening and reading skills fosters rich opportunities, which bring about particular effects on the way students take responsibility to learn and understand through the medium of new activities [37]. Second, the potential opportunities made available by the student-student interaction can bring about teacher availability in the actual-life scenes of the gamified activities which in turn promote student engagement for learning and comprehension [38]. From the socio-cognitive standpoint, diversified scenes of VRGs allow for tutoring and intimate teacher-student interaction, which in turn pave the way for student engagement and smooth cognitive comprehension process [39]; this way, the objectives of this study are as follows:

1. Examining the possible interaction between coach-student interaction and applicability of the post-comprehension VRGFCs to promote students' EMP skills;
2. Solicit students' perception of coach-student interaction in the different VRG-supported flipped EMP classrooms.

## II. METHOD

### A. Participants and design of the study

To conduct this study within the confidence of 99% and margin of error of 1%, a sample with 240 students was selected from the population size of 308 undergraduate students (females = 253, males = 95) of medical sciences. The participants took the two-credit obligatory lesson of English for Medical Purposes in the first semester of the academic year 2019 at *Isfahan University of Medical Sciences*. They were students of nursing (N = 112), midwifery (N = 54), rehabilitation (N = 56), health Information Technology (N = 64), and anesthesia (N = 62). Fifty one students who were absent in the first introductory stage and who did not show tendency to pass EMP through the flipped classrooms were excluded the course.

To examine the effects of coaching in the applicability of VRGFCs for teaching EMP comprehension skills, the participants sat in circles with five members from similar and different comprehension proficiency levels. The participants' comprehension proficiency level was assessed through an online English comprehension test. The comprehension test with 60 multiple-choice items was developed by the chief researcher using the items of the Ministry of Health English Exam. The participants were randomly divided into two sets to be coached by five teachers under different disciplinary circumstances like this:

While in the first set the subject-area teachers coached EMP comprehension skills to homogeneous or heterogonous five-member circles of the disciplinary groups; in the second set English teachers taught the same skills to the homogeneous or heterogeneous circles of disciplinary groups.

### B. Materials and activities

The materials as well as the assessment activities were selected from the major textbooks that were enacted by the high council of education as the main sources of EMP [40-44]. To assess the participants' comprehension continuously throughout the online teaching session, the online format of activities was developed. They were 16 series of scalable activities.

A VRG corpus for the post-comprehension practicum of the flipped classrooms was developed by a Game Production Institute in the Iran Computer and Video Games Foundation under the surveillance of the main researcher. This corpus contained 92 VRGs with cued scenes to be practiced with the active presence of students collectively. The VRGs provided the students with verbal annotated scenes and in both listening and reading comprehension. Before developing the VRGs, the researchers and game developers discussed what should be included in the VRGs, so that the students would have rich opportunity for practicing the comprehension skills in actual-life-like arenas.

*C. Procedure*

In this study, three levels of data were collected: formative assessment of students' progress in the indoor online classrooms, formative assessment of students' performance in the fields through mini-CEX, and a focus-group interview.

At the beginning of the study using National Learning Management System (*NAVID*), the students took part in a pilot VRGFC requiring them to become familiar with the functions of VRGFCs, had an indoor online-instructional-learning session and assessment on EMP listening and reading comprehension. They were then asked to have collaborative attempt for doing an VRGs coached by the teachers. When the participants set off to complete the VRGs, in addition to their fellow students' feedback, the tutors directed the participants' attention to whether true scenes and verbal cues were matched to run the VRGs, or whether the scenes were unscrambled in an appropriate way. Later in this introductory stage, the participants had interaction with peaked patients to make sure they knew how to offer answers to the patients' needs.

Mention should be made that that a training session to the tutors was administered before the start of this introductory stage. The teachers trained for coaching and familiarized themselves with the assessment and tutoring guidelines in the VRGs. As coaches of the circles, the teachers provided immediate help when the students encountered problems.

During a 16-session course of the flipped classrooms, in each indoor session, the participants were required to take part in indoor online instructional-learning and classrooms to learn the materials and to be assessed by answering activities. Then, they were required to be convened through the discussion platform of *NAVID* and co-complete the VRGs. *NAVID* was selected for the participants to interact with the VRGs, with the user-friendly application of providing a milieu for ubiquitous online discussion and teacher availability for tutoring; this way, *NAVID* allowed students from different districts to get together. The 16 VRGFCs for teaching, assessment, and practice are as follows:

In the 16 indoor sessions, using BigBlueButton software the participants in the first set were taught the comprehension skills by the subject-area teachers and the participants in the second set were taught by the English teachers in 45 minutes. After ending teaching in each online-class session, the participants fulfilled the comprehension check activities individually in 20 minutes to be assessed continuously.

In the post-comprehension outdoors, this course used weekly VRG listening and readings to facilitate circle interaction for comprehension. Students convened in the intradisciplinary or interdisciplinary groups through the discussion groups of *NAVID* to practice the VRGs. The groups consisted of 48 five-member homogeneous and heterogeneous circles to unscramble the oral and written annotations of VRGs and address the actual-life needs there under the coaching surveillance of the subject-area teachers (first set) and English teacher (second set). During the VRGs, the teachers guided the participants through their collaboration for fulfilling the activities and browsed through their turns to accomplish the VRGs. The participants were required to accomplish the VRGs in the outdoor circles and upload it to *NAVID*. Once the participants uploaded the accomplished VRGs to *NAVID*, their subject-area or English teachers tutors provided feedback respectively for subsequent VRGs. The participants then read the comments and listened to the coaches' oral comments. The subject-area or English teachers provided apt assistance with any problems faced by the participants with their comprehension. After the participants finished their revisions, they then uploaded the rectified VRGs to *NAVID* again. In each session, with the feedback and fulfilling the VRGs, students then proceeded with the outdoor round of the EMP comprehension VRGFCs.

Later, the participants were engaged in the actual-life fields to communicate with patients and read their files and address their needs. In the fields, the participants were asked to state a position, read the patients' medical fields, and listen to their complaints focusing on details they could include to ensure that the patients gain satisfying answers. To complement the participants' answers and develop their comprehension proficiency, the participants were engaged to interaction with the coaches. The coaches gave reasons, supported by the materials presented in the online-classroom materials. Therefore, the participants first addressed the patients' needs and then they were supported by their coaches. The interaction between the participants and a patient in the healthcare fields was assessed after every fifth session through Mini Consultation Evaluation Exercise (mini-CEX**)** by five subject-area teachers other than those who taught and tutored the VRGFCs. The Mini-CEX was a 20-point rating scale was developed by the researchers.

## III. RESULTS

The analyses of the participants' comprehension progress during the course and their comprehension in the healthcare fields, as well as their responses to the prompts of the focus-group interview indicated that the participants benefited from learning EMP comprehension in the VRGFCs. Post-comprehension VRG-supported practicums coached by the subject-area or English teachers facilitated comprehension process in both academia and fields. Besides, the teacher-student interaction and availability of coaches in the circles of students enabled the students to address their counterparts' needs in doing the VRGs and patients' needs properly.

The results of the formative assessment revealed that (1) subject-area vs. English teachers' coaching role, (2) the circles structure and disciplinary circumstances paved the way for student engagement in the EMP comprehension process, (3) teacher support in the coaching process kept the student engagement to accomplish VRG-supported comprehension activities. This way, the participants were appeared optimistic about the tutoring role of teachers in guiding the circles of

students in doing the VRGs. Such a learning experience in the tutored VRGFCs worked round to promote the applicability of the VRGFCs for teaching and learning EMP comprehension skills by engaging students in interaction with teachers, partners, and patients. The results are presented in line with the research purposes.

Descriptive statistics of the formative assessment shown in Table I, the mean scores of the assessment followed an ascending trend towards growing understanding of the materials. In the last session, however, while coaching the circles by the subject-area teachers in the VRGFCs resulted in the participants' progress by 28.1 points in homogeneous circles and 30.3 points in heterogeneous circles, coaching the participants by the English teachers resulted in 28.7 points in the homogeneous circles and 30.9 heterogeneous comprehension circles. Teachers' tutoring role topped the rank in the mean difference, followed by the circles wherein the VRGs were practiced. Put simply, the highest level of VRGFC applicability in teaching and learning EMP comprehension skills occurred when the heterogeneous circles of the participants practiced the VRGs under the coaching surveillance of the English teachers.

TABLE I. MEAN SCORES OF THE COMPREHENSION PROGRESS OF THE SETS

| Sets | Circles | Mean (SD)1 | Mean (SD)16 |
|---|---|---|---|
| 1 (the subject-area coaches) | homogenous | 25.2(3.8) | 28.1(3.9) |
| | heterogeneous | 26.4(4.6) | 30.3(4.5) |
| 2 (the English coaches) | homogenous | 25.2(3.9) | 28.7(3.8) |
| | heterogeneous | 26.4(4.4) | 30.9(4.6) |

Fitting linear mixed model shown in Table II further revealed the participants' significant improvement in the comprehension ($p$<.001), suggesting the significant effect of coaching (F= 31.706, Sig. = .000) and circles (F=327.746, Sig. = .000) in the model. The results, however, revealed the no-significant effect of the disciplinary groups (F= 1.944, Sig.=.163) in the model. The interaction effect of teachers' coaching and circle (F= .261, Sig. = .609) as well as the interaction effect of coached VRGFCs (F= 2.850, Sig. = .091) were not significant in the model.

TABLE II. FITTING LINEAR MIXED MODEL FOR THE COMPREHENSION

| Source | Numerator df | Denominator df | F | Sig. |
|---|---|---|---|---|
| coaching | 1 | 7571.4 | 25.9 | .000 |
| circle | 1 | 7571.4 | 327.7 | .000 |
| disciplinary groups | 1 | 7571.45 | 1.94 | .163 |
| tutoring VRGFC * circle | 1 | 7571.45 | .26 | .609 |
| tutoring VRGFC * group | 1 | 7571.45 | 2.85 | .091 |

As shown in Table III, learning EMP comprehension skills in the set tutored by the subject-area teachers resulted in the participants' underperformance in average 0.53. Also, learning comprehension skills in the homogeneous tutored circles resulted in underperformance in average 0.90.

TABLE III. ESTIMATE OF FIXED EFFECT IN THE MODEL FOR THE COMPREHENSION SKILLS

| Parameter | Estimate | Std. error | df | t | Sig. |
|---|---|---|---|---|---|
| [subject-area coached VRGFCs=1] | -0.53 | 0.07 | 7582.02 | -7.56 | .000 |
| [homogeneous=1] | -0.90 | 0.05 | 7582.02 | -18.06 | .000 |

A detailed examination of each comprehension skill in each coached set through fitting linear mixed model (Table 4 and Table 5) revealed the significant effect of tutoring EMP reading (F= 13.16, Sig.= .000) and listening (F= 13.28, Sig.= .000) in the model. The effect of disciplinary groups, however, was not significant in the model for both reading (F=1.83, Sig.=.18) and listening (F=.46, Sig.= .5) comprehension skills. The interaction effect of coaching and circles were not significant in the model for reading (F=.000, Sig.= .94) and listening (F= .41, Sig.= .52). Similarly, the interaction effect of tutoring and groups were not significant in the model for EMP reading (F= .52, Sig.=.47) and listening (F= 3.04, Sig.= .08) comprehension skills. Whether in the homogeneous coached circle or heterogeneous tutored circle, the participants significantly benefited from interaction in disciplinary groups.

TABLE IV. FITTING LINEAR MIXED MODEL FOR THE COMPREHENSION OF THE SETS

| Comprehension skill | Source | Numerator df | Denominator df | F | Sig. |
|---|---|---|---|---|---|
| Reading | coaching VRGFC | 1 | 3808.52 | 13.1 | .000 |
| | circle | 1 | 3808.52 | 171.2 | .000 |
| | group | 1 | 3808.52 | 1.83 | .18 |
| | coaching VRGFC * circle | 1 | 3808.52 | 0.00 | 0.94 |
| | coaching VRGFC * group | 1 | 3808.52 | 0.41 | 0.52 |
| Listening | coaching VRGFC | 1 | 3799.81 | 13.2 | .000 |
| | circle | 1 | 3799.81 | 163.1 | .000 |
| | group | 1 | 3799.81 | .46 | .50 |
| | tutoring VRGFC * circle | 1 | 3799.81 | 0.5 | 0.47 |
| | tutoring VRGFC * group | 1 | 3799.81 | 3.04 | 0.08 |

## IV. DISCUSSION

In this section, discussion on the findings of this study is provided in relation to the purposes and the quantitative and qualitative phases. This is followed by a discussion about the limitations of the study and suggestions for further study.

**Initial purpose:** Examining the possible interaction between tutor-student interpersonal communication and applicability of the pre-comprehension VRGFCs to promote students' engagement and EMP comprehension in both academia and healthcare fields.

Quantitative results indicated that the applicability of VRGFCs for teaching and learning EMP comprehension skills

arose from a variety of sources: teacher role to coach the students and student supports in the circles of the disciplinary groups. The construct of tutored VRGFCs addressed how the teachers' tutoring support during the course and student engagement, collaboration and immediate feedback, affected the participants' comprehension and performance. Comprehension difficulties and the unconnected support of the subject-area teachers for coaching and their narrow communication interaction with the English teachers, causing the students to be concerned that they might not be able to address the needs, easily affected progress and performance. When compared with the subject-area teachers' tutorage role in the VRGFCs, the English teachers' tutorial role featured closer interpersonal communication for comprehension and tackling the needs. Because the process of tutoring the participants in the VRGs by the English teachers involved more active engagement of students and higher level of cohorts' support, the English teacher-coach-led VRGFCs were more applicable for teaching EMP comprehension and outperformance. The results of the study echoed the findings mentioned by previous researchers. Imperfect tutoring of students in the new EdTech-assisted practicums slows down the comprehension progress rate. Student engagement was a determinant that facilitates the comprehension process during the course. Because the student level of active participation is not static, it indicates the students' EMP comprehension level varies during the course of learning the listening and reading materials. Such results revealed that student engagement in learning and comprehension process acted as an important mediator in EMP comprehension aligning with previous researchers' statements that student active participation was beneficial to comprehension [20].

These findings were supported by qualitative results which underscored coaching in unburdening the comprehension process and cohorts' support in the circles of doing VRGs assuming responsibility towards tackling the needs.

There were students' different opinions in how coaching influenced engagement, comprehension, and performance, with effects being stated. Although more participants perceived coaching to be facilitative in learning EMP skills, the other minorities voted against coaching the circles of doing VRGs; this is a surprising finding, as typically coaching is considered the conditions of differentiated instruction with students' needs could be addressed.

A number of researchers have attempted to explain how teachers' availability can act facilitate students' learning and comprehension ([8]). Khazaie et al. [16] propose that, if students perceive coaching as a closer interaction with teachers, they will seek for their cohorts' support for negotiation of concepts. These researchers believe that this perception facilitates cognitive process of comprehension and performance, as well as reducing the cognitive load that is often associated with miscomprehension. This interpretation may explain the underperformance of some participants in the subject-area teachers' tutored circles of doing VRGs and outperformance of some participants who were tutored in the circles of doing VRGs by the English teachers.

Although the perceived facilitative effects of English teachers' tutoring of circles in doing VRGs of the flipped classrooms are one of the important findings of this study, a greater understanding is needed of how these facilitative tutoring can be enriched. It is also important that educators highlight their availability in the flipped language classrooms. Although tutoring may have facilitative effects for some students, it can also jeopardize the student engagement.

The analysis of qualitative data indicated that the participants applied different strategies during the study. Most frequently cited were cognitive and support strategies with addressing the need function. Many participants who reported employing vicarious strategies sought information from the coaches and peers. These findings augmented the literature, because few studies have investigated how teachers' tutoring role in the flipped ESAP classrooms can enhance students' engagement and comprehension in addressing the needs.

## Qualitative phase

**Second purpose:** Solicit students' perception of coach-student interaction in the different VRG-supported flipped EMP classrooms.

Qualitative analysis was conducted on data from the selected students' responses to the interview prompts and was carried out through thematic analysis. The researcher identified the themes without using theoretical view to the gathered data.

To that end, the chief researcher read the selected students' responses for at least three times to immerse himself in the content; this way, primitive thoughts were defined. Then, data were coded by the researcher; 22 codes were defined. Following this stage, four codes were formulated. Two codes were merged into a code in the later stage. Finally, representative sentences were taken to illustrate the themes. To analyze the gathered data the qualitative analysis software Coding Analysis Toolkit was used. These stages were reviewed by two English and subject-area teachers who were experts in analyzing qualitative data.

The overall results revealed that the selected students showed positive perceptions about their experience of learning EMP comprehension in the tutored VRGFCs. Their responses highlighted the need to close teacher-students communication, particularly when they adopt active role to accomplish new VRGs in the flipped EMP comprehension classrooms. Such results were evidenced by their responses on three closely related themes: (1) social; (2) psychological; and (3) comprehension and performance.

**Social**

In most cases, the participants found the tutored VRGFCs as an ambience to be an innovative way to reduce teacher-students distance and define supportive active role for students in the EMP comprehension process.

The selected students from the heterogeneous circles highlighted the positive effect of receiving feedback from the fellow students while attempting to do VRGs in the discussion forums. Similarly, the differences between subject-area teachers' and English teachers' tutoring of the VRGFCs was noted in the participants' comments. The students from the heterogeneous circles expressed their positive perception of practice through the VRGs. Furthermore, the students specifically commented on the positive effect of their interpersonal communication with tutors for fulfilling comprehension activities by pointing out that the English teacher tutored VRG-assisted practicums are good fit with learning EMP comprehension skills. One participant said that "I had adopted different strategies in cooperation for doing comprehension under the English teacher coaching, so as to strengthen my competence for addressing the patients' needs." Nonetheless, three students expressed their concerns about doing the VRGs in the flipped classrooms tutored by the subject-area teachers, given they are virtually void of rich interpersonal communication to practice EMP comprehension skills.

The participants commented that defining active role for students was difficult in the homogeneous circles where synchronous collaboration occurred. Without sufficient preparation, students found it difficult to work out the real-life fields. On the other hand, they said that, asynchronous collaboration for doing VRGs occurs in the heterogeneous circles of the disciplinary groups wherein students with higher levels of skills played leading role for supporting their peers.

**Psychological**

Generally, most of the students mentioned that the VRG-assisted flipped comprehension classrooms take into account both teachers' and students' psychological comprehension process. They acknowledged the post-comprehension VRG-assisted practicums as rich of visual and verbal cues and the cross-contextual features of the VRGFCs made the communication with teachers an easy task by visualizing the real-world. In the meantime, ubiquitous tutoring of the teachers alongside with their immediacy established the smooth transition between the instructional-learning contexts and the field unburdens students' cognitive process of EMP comprehension. The students mentioned that their collective participation in the circles and their peers' collaboration and support for doing the VRGs helped them to have true images of the problems and needs that they were to address. A male student tutored by the subject-area teacher in the VRGFC, in particular, stated that "doing VRGs helped me sense the unity of my practice through different adjustments". The participants even mentioned "the experience of co-practicing" that they had not experienced in previous English classrooms. Therefore, despite the diversity of the practices in the course, the students were still interested in heterogeneous collaboration in keeping their knowledge of their fields up-to-date. From the participants' view, hands-on teaching was a guided experience for the students that assisted them in connecting their learning and comprehension.

**Comprehension and performance**

The final theme in student analysis was based on the comprehension and performance resulting from practicing listening and reading skills the VRGFCs. In most cases, the students recorded beneficial outcomes. The students attributed their understanding of the materials and outperformance to the active participation in the coached VRGs included in the flipped classrooms, saying that we gained so much in proactive strategies to visualize the patients' needs in the healthcare fields and that they were not afraid of listening or reading English content materials in indoor and outdoor situations. One female participant coached by English teachers in the heterogeneous circles specifically commented: Before I was being taught ESAP in the VRG-supported flipped classrooms, I had had no idea that how the scenes of VRGs in listening and reading boost my transition. After I attend in the EMP flipped classrooms and tutored by the English teacher, I realized that asynchronous collaboration for doing VRGs could enable me to connect the academia to the fields.

The participants realized their growth in autonomous learning, noting that such VRGFCs provided them with rich opportunities for self-correction through collaboration with and support from fellow students. A male participant tutored by the subject-area teacher said that "I enjoyed learning comprehension seeing as I was more engaged and active in supporting my peers and organizing their thoughts". Another female participant tutored by the subject-area teacher had a similar thought, that "Instead of relying on teachers' support, I spend more time organizing my peers' collaboration and thoughts into a coherent structure".

Together with the quantitative data, the qualitative information from the interview re-affirmed the importance of coaching and collaboration among students in facilitating their comprehension and improving performance. tutoring including teacher active participation for supporting students' in fulfilling VRGs not only facilitated better students' preparation for indoor listening and reading comprehension but also enhanced students' interest to work out contents in real-life situations. Collaboration such as collaborative attempt for supporting peers in the process of understanding the listening and reading materials and tackling the needs, likewise contributed to the students' knowledge of their comprehension and performance problems as well as the patients' needs, as perceived by the students. Teachers' tutoring, self-paced learning, constructive feedback from coaches and peers, and state-of-the-art ways of formulating actual-life-like arenas exemplified in the VRG-supported flipped classrooms prevented students from reverting back and helped they become more engaged in developing tailor-made solutions.

## V. Conclusion

The research reported in this study explored the (non)-dependency of the VRGFCs applicability on the (subject-area vs. English) teachers' coaching of the students' in the post-comprehension VRGs. The findings contribute to an increased understanding of how teacher' tutoring supports student engagement and how supports of cohorts facilitates comprehension process and performance in the fields. Results revealed that teacher immediacy contributing factor in students' active participation and teacher-student close interpersonal communication was a desirable experienced EMP learning and perception among the students who were tutored by the English teachers and supported by their cohorts of higher English proficiency levels in doing the post-comprehension VRGs. Significant differences in the applicability VRGFCs for teaching and learning EMP comprehension skills were found for the way of tutoring, support, and active engagement in doing the VRGs. It was found that students perceived close interpersonal communication with teachers to be greater when they were supported by their cohorts of different English proficiency levels, as miscomprehension was resolved and patients' needs were substantially addressed.

In the instructional-learning contexts, teacher-student communication is often viewed as a socio-psychological facet of ESAP education with constructive consequences; similarly, a new finding from this study was that teachers' availability in the VRGs had a facilitative effect on students' engagement and comprehension. It seems important that teachers devise new ways to reduce the perceived distance in their communication students for teaching ESAP skills.

In order to address the patients' need, students reported real-life scenes or instantiation of real-life fields under direct tutorial surveillance of teachers. Another important finding was that easy addressing the needs was linked to the facilitative effects of cohorts' supports in the assorted circles as well. Helping each other to tackle the comprehension needs, and particularly patients' needs, may therefore be beneficial. Fostering a supportive social and psychological instructional-learning context was perceived by students as important for facilitating comprehension. Central to this is helping students in the circles get to foster interaction between themselves and the patient, in order to enjoy the benefits of the coaching supports provided by the teachers.

The findings of this study are significant for teachers who are developing gamified ESAP practicums. It is of note that educators have an awareness of the potential facilitative effects of teacher availability and teacher-student interaction, so that appropriate support can be provided to increase the applicability of games in ESAP education.

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