###### Virtual Classroom Literature Search Results

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| --- |
| **Research question or topic:**  Virtual classrooms: Best practice or tips & tricks/guidance; evidence for effectiveness: |
|  |
| **Name of person/ team requesting search:**  Name Alison Potter E-Leaning programme Manager (Quality Dept) Southern House |
| **Completed by:** HEE Knowledge Management Team (MH)) |
| **Date:17/07/2020** |
| **Please acknowledge this work in any resulting paper or presentation as:**  Evidence Search: Health Education England Knowledge Management Team |

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# **Search headlines**

All the results have full text links are within the last 5 years and mostly in health-related environments (but not entirely). Also, extensive abstracts/summaries have been included. Sections on design and tips and techniques follow for convenience, but the full texts cover aspects of the virtual classroom such as facilitation and good practice especially for interactive facilitation.

# **Comments from Knowledge Management/ searcher**

Synchronous real time techniques are beginning to appear more frequently in the digital delivery of online content.

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| Complete numbered list of results with links | | | |  |
|  | **Citation** | **Abstract/ key themes** | **Link** |  |
| Theme Headlines | | | |  |
| 1 | **Learning and instruction in the hybrid virtual classroom: An investigation of students’ engagement and the effect of quizzes**  **Author(s):** Raes, Annelies; Vanneste, Pieter; Pieters, Marieke; Windey, Ine; Van Den Noortgate, Wim; Depaepe, Fien  Computers & Education; Jan 2020; vol. 143 | To deal with the current need for flexible learning trajectories giving access to a more diverse group of learners, synchronous hybrid virtual classrooms have been designed to connect both on-site students and remote students during synchronous teaching. Given synchronous blended learning is relatively new, there are only few studies that have investigated its use and effectiveness. Furthermore, the existing literature is mostly exploratory and qualitative in nature. This present study meets the need for empirical, theory-driven research. More specific, this study has set up an experiment to investigate how different learning settings can affect students' relatedness, intrinsic motivation and learning achievement in the context of a synchronous learning space. The Self-Determination Theory (SDT) namely stresses that relatedness is a contributing factor for intrinsic motivation and indirectly also predicts learning achievement. Although there are numerous studies using SDT in various contexts, only limited studies used this theory to examine learning in the hybrid virtual classroom comparing different learning settings and its effects on relatedness, intrinsic motivation and learning achievement. The educational setting depends on whether students are physically present and thus attend the lecture face-to-face (F2F) or remotely (virtual), and on whether the setting is the same for all students (pure) or mixed (hybrid). This study presents the results of an experimental within-subjects design study comparing the students' learning experiences as F2F versus virtual student in the pure or hybrid setting. A mixed-methods approach is used including real-time measurements of intrinsic motivation next to retrospective self-report surveys and interviews. Also the effect of quizzes has been consistently investigated. The results show that although the hybrid virtual classroom is promising regarding flexibility in education as it gives students the choice where to attend the course, it is also the most challenging one to teach in and to learn in as a remote participant. It has been found that both the relatedness to peers and the intrinsic motivation is the lowest in the hybrid-virtual setting. Yet, our results show that launching quizzes is positively related to all students’ motivation. Further research that implements different kinds of quizzes and at different time intervals is necessary to validate this finding in the context of the hybrid virtual classroom. Future research should also investigate how relatedness between the remote students and their on-campus counterparts can be improved by means of instructional interventions | [Computers & Education](https://doi.org/10.1016/j.compedu.2019.103682) - from Unpaywall |  |
| 2 | **Investigating research approaches: Classroom-based interaction studies in physical and virtual contexts**  Author(s): Hartwick, Peggy  Source: ReCALL: Journal of Eurocall; May 2018; vol. 30 (no. 2); p. 161-176 | This article investigates research approaches used in traditional classroom-based interaction studies for identifying a suitable research method for studies in three-dimensional virtual learning environments (3DVLEs). As opportunities for language learning and teaching in virtual worlds emerge, so too do new research questions. An understanding of research design benefits and limitations is timely for those exploring how interaction occurs between users, and users and the virtual space, and how these interactions make sense within a broader theoretical framework. As a first step, the article describes the types of interaction that are significant to classroom-based research studies, such as learner–learner. This is followed by a historical overview of research approaches and methods used in interaction studies, from early quantitative, to descriptive and qualitative, to mixed-method approaches. Following this overview, the author critically surveys research approaches, methods, analytical tools, and data collection techniques used in physical and virtual second language classroom interaction studies. The article concludes by highlighting the implications and research considerations for the design of new research studies in 3DVLEs | [ReCALL](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145347&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=0958-3440&volume=30&issue=2&spage=161) - from ProQuest (Health Research Premium) - NHS Version |  |
| 3 | **Lurking and participation in the virtual classroom: The effects of gender, race, and age among graduate students in computer science**  Computers & Education  Volume 151, July 2020, 103854  Computers & Education  Author links open overlay panel Isabel Ruthotto a, Quintin Kreth a, Jillian Stevens b, Clare Trively a, Julia Melkers PhD a | <https://www.sciencedirect.com/science/article/abs/pii/S0360131520300543>  Highlights  •  We find that the intensity of online participation in graduate school discussion boards varies by demographics.  •  Older adults are more likely to actively participate in online required classroom forums than are younger graduate students.  •  Larger class size is associated with decreasing levels of active participation and increasing lurking behavior.  •  Lurking behavior is continuous, shedding light on the notion of what constitutes participation. | See Link |  |
| 4 | **Guest Editorial**  **Coronavirus disease (COVID-19) prevention: Virtual classroom education for hand hygiene**  Nurse Education in Practice  Volume 45, May 2020, 102782  Nurse Education in Practice  Author links open overlay panel Yuet-Ming Ng EdD, Pui Lai Peggy Or PhD | <https://www.sciencedirect.com/science/article/pii/S1471595320302730>  Highlights  •  Suspending campus learning during COVID-19 outbreak.  •  Addressing the learning gap between hand hygiene theory and practice.  •  Proposing a 3-step virtual classroom approach.  •  Supporting nursing educators to strengthen hand hygiene teaching | See link |  |
| 5 | **The transition from traditional classroom to the virtual classroom: Two faculty experiences**  (2 pdfs- see link) | <https://sigma.nursingrepository.org/handle/10755/20228>  Discussion of faculty experiences in transition of RN-BSN program from traditional to virtual classroom learning guided by Garrison’s model of community of Inquiry. The process of faculty development, student training, technical support, implementation, challenges,students and faculty reflections are shared to assist programs embarking on online pedagogy for successful adoption. | See link |  |
| 6 | **Teaching to Connect: Community-Building Strategies for the Virtual Classroom**  Berry, Sharla  *Online Learning*, v23 n1 p164-183 Mar 2019 | <https://eric.ed.gov/?id=EJ1210946>  A sense of community is central to student engagement and satisfaction. However, many students struggle with developing connections in online programs. Drawing on interviews with 13 instructors, this paper explores the strategies that they use to help students develop a sense of community in synchronous virtual classrooms. Four strategies for building community online are identified: reaching out to students often, limiting time spent lecturing, using video and chat as modes to engage students, and allowing class time to be used for personal and professional updates. | See link |  |
| 7 | **Building Relationships and Increasing Engagement in the Virtual Classroom: Practical Tools for the Online Instructor**  Martin, Jeffrey  *Journal of Educators Online*, v16 n1 Jan 2019 | <https://eric.ed.gov/?id=EJ1204379>  Online education is rapidly increasing in popularity across the globe. Instructors and professors struggle to engage with and build meaningful relationships with online students in the same manner as on ground students, and without this critical component in place, online students report a lack of interest, and thus, they produce a lower quality of work and report less overall satisfaction. There are a host of tools and strategies that may be used by the online instructor to build meaningful relationships with students and increase these satisfaction levels. This article discusses multiple approaches using both basic and technological tools to manage the online classroom. These tactics reach out to the online student, build these important relationships, and create a greater sense of satisfaction and produce a higher level of work by the online student. | See link |  |
| 8 | **Quality improvement in virtual classroom.**  *Journal of Patan Academy of Health Sciences*, *6*(1), 78-82. https://doi.org/10.3126/jpahs.v6i1.27086  Bajracharya, S., Shrestha, A., & Jnawali, P. (2019). | <https://www.nepjol.info/index.php/JPAHS/article/view/27086>  Introductions: Online teaching method has shown to be equally effective as the traditional teaching method. An online teaching method, the virtual classroom (VCR) was developed for undergraduate medical students of Patan Academy of Health Sciences (PAHS). This study aims to present the outcome of complete audit cycle of VCR for quality improvement of the program.  Methods: Feedbacks were collected from final year medical students who are posted in four different rural sites of PAHS. A validated google feedback form was used to collect the feedbacks from individual students after every VCR sessions. Students from 2017 were group one and students from 2018 were group two. Feedbacks were recorded in Likert scale of five. Ratings were done for quality of video, sound and power supply. Plan, do, study, and act (PDSA) cycle was used for quality improvement process. The necessary changes were done after analysis of data from group A. Same process was repeated for group B.  Results: Fifty-six feedbacks were collected in first cycle. The complete PDSA audit cycle showed improvement in quality of VCR, with mean score on video of 3.0 and 4.1, audio 3.1 and 4.03, internet 3.6 and 4.03, power supply 4.0 and 3.98 in first cycle group A vs second cycle group B.  Conclusions: Improvement was achieved by running quality feedback cycle and quality improvement cycle should be continued to maintain the quality achieved with this process. | See Link |  |
| **Design** | | | |  |
| 9 | **Utilizing VoiceThread Technology to Foster Community Learning in the Virtual Classroom**  Author(s): Stamps, Adrian; Opton, Laura L  Source: Journal of Nursing Education; Mar 2019; vol. 58 (no. 3); p. 185 | VoiceThread was utilized in an online accelerated Bachelor of Science in Nursing program to promote team learning in a pharmacology course. The goals of the activity were to (a) actively engage students in the course content and (b) create a social learning environment. | [The Journal of nursing education](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145347&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=0148-4834&volume=58&issue=3&spage=185) |  |
| 10 | **Combination of a Flipped Classroom Format and a Virtual Patient Case to Enhance Active Learning in a Required Therapeutics Course.**  Author(s): Lichvar ; Hedges, Ashley; Benedict, Neal J.; Donihi, Amy C.  Source: American Journal of Pharmaceutical Education; Dec 2016; vol. 80 (no. 10); p. 1-8 | Objective. To design and evaluate the integration of a virtual patient activity in a required therapeutics course already using a flipped-classroom teaching format. Design. A narrative-branched, dynamic virtual-patient case was designed to replace the static written cases that students worked through during the class, which was dedicated to teaching the complications of liver disease. Students completed pre- and posttests before and after completing the virtual patient case. Examination scores were compared to those in the previous year. Assessment. Students' posttest scores were higher compared to pretest scores (33% vs 50%). Overall median examination scores were higher compared to the historical control group (70% vs 80%), as well as scores on questions assessing higher-level learning (67% vs 83%). A majority of students (68%) felt the virtual patient helped them apply knowledge gained in the pre-class video lecture. Students preferred this strategy to usual in-class activities (33%) or indicated it was of equal value (37%). Conclusion. The combination of a pre-class video lecture with an in-class virtual patient case is an effective active-learning strategy. | Available at [American Journal of Pharmaceutical Education](http://europepmc.org/search?query=(DOI:10.5688/ajpe8010175)) - from Europe PubMed Central - Open Access  Available at [American Journal of Pharmaceutical Education](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145347&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=0002-9459&volume=80&issue=10&spage=175) - from ProQuest (Health Research Premium) - NHS Version  Available at [American Journal of Pharmaceutical Education](https://www.ajpe.org/content/ajpe/80/10/175.full.pdf) - from Unpaywall |  |
| 11 | **Navigating Healthcare Science Student Learning and Engagement Through Implementation of a Virtual Classroom**  Conference presentation | <https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1421&context=cnso_bio_facpres>  This study explored whether virtual classrooms can be utilized to facilitate student learning and engagement. **Background**. University students and their learning approaches undergo constant changes, mainly due to advances in technology. Therefore, student expectations are continuously shifting. Although technology allows easier access to learning material, students still depend on a structured learning environment facilitated by an instructor to receive and process the correct information. **Methods**. A virtual classroom developed and housed in Second Life was used to deliver a week-long course on health promotion. Thirty students from different healthcare science programs participated in the study. After a 15-minute live orientation session, participants explored the classroom for a week, completed a short quiz, and described their experience using a survey. The quiz was completed via Canvas while Qualtrics was used to capture student experience. SPSS v.26.0 was utilized to run correlation and cluster analyses. **Results**. Hierarchical cluster analysis was completed in order to identify groups of students that had similar characteristics. The results partitioned students into three clusters characterized by quiz score, belief in difficulty of the content and technology. Correlation analysis revealed that students who perceived the course content as challenging also expressed that the control devices interfered with performance within the virtual classroom; r(22)=0.473, pConclusion. 82% of the participants believed that the Second Life platform can serve as an alternative to supplement occasional live student engagement and learning | See link |  |
| 12 | **Virtual classroom in the digital age: concept, product and applicability. In**: Electronics, Communications and Computing: extended abstracts of the 10th Intern. Conf.: the 55th anniversary of Technical University of Moldova, Chişinău, October 23-26, 2019 | <http://ip-81.180.74.21.utm.renam.md/handle/5014/5868>  Given paper presents itself as a descriptive ascertaining study that comes with the analysis of the phenomenon of virtual classrooms' using at the different educational levels and / or in the different educational situations in the digital age, characterized by the migration of the implementation of certain ICT instruments, which have already become traditional, to the so-called online learning platforms of various types and configurations. The research is carried out on several dimensions, in particular, conceptual, but also application-functional, reviewing several platforms dedicated to virtual learning. | See link |  |
| **Skills/Tips** | | | |  |
| 13 | **Enhancing conceptual knowledge: an approach to using Virtual Environment for Radiotherapy Training in the classroom.**  Author(s): Montgomerie ; Kane, J. P.; Leong, A.; Mudie, B.  Source: Journal of Radiotherapy in Practice; Jun 2016; vol. 15 (no. 2); p. 203-206  Publication Date: Jun 2016 | No Abstract See link | [Journal of Radiotherapy in Practice](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145347&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=1460-3969&volume=15&issue=2&spage=203) - from ProQuest (Health Research Premium) - NHS Version |  |
| 14 | **Identifying Anxiety Through Tracked Head Movements in a Virtual Classroom**  Author(s): Won A.S.; Perone B.; Friend M.; Bailenson J.N.  Source: Cyberpsychology, behavior and social networking; Jun 2016; vol. 19 (no. 6); p. 380-387 | Virtual reality allows the controlled simulation of complex social settings, such as classrooms, and thus provides an opportunity to test a range of theories in the social sciences in a way that is both naturalistic and controlled. Importantly, virtual environments also allow the body movements of participants in the virtual world to be tracked and recorded. In the following article, we discuss how tracked head movements were correlated with participants' reports of anxiety in a simulation of a classroom. Participants who reported a high sense of awareness of and concern about the other virtual people in the room showed different patterns of head movement (more lateral head movement, indicating scanning behavior) from those who reported a low level of concern. We discuss the implications of this research for understanding nonverbal behavior associated with anxiety and for the design of online educational systems. | Available at [Cyberpsychology, Behavior, and Social Networking](http://pdfs.semanticscholar.org/3fba/373964fe6f3df9c7cc26ad7cb11f22d7c184.pdf) - from Unpaywall |  |
| 15 | **The effects of a virtual tutee system on academic reading engagement in a college classroom**  Author(s): Park, Seung Won; Kim, ChanMin  Source: Educational Technology Research and Development; Apr 2016; vol. 64 (no. 2); p. 195-218 | Poor student engagement with academic readings has been frequently reported in college classrooms. As an effort to improve college students’ reading engagement, researchers have developed a virtual environment in which students take on the role of tutor and teach a virtual tutee, the virtual tutee system (VTS). This research examined the effectiveness of the VTS for enhancing students’ academic reading motivation, engagement, and performance. Two groups of college students were compared: students who used the VTS and those who used an online reading guide (RG). Both quantitative and qualitative data were used to acquire a better understanding of reading motivation and engagement. The study found that students in the VTS group engaged in a deep level of cognitive processing when they completed the reading assignments. They also exhibited a higher reading performance than students in the RG group. These findings imply that teaching and interacting with a virtual tutee promotes students’ deep engagement in reading activities. The paper discusses study limitations and suggestions for future research. | [Educational Technology Research and Development](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145347&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=1042-1629&volume=64&issue=2&spage=195) - from ProQuest (Health Research Premium) - NHS Version  Available at [Educational Technology Research and Development](http://openurl.ebscohost.com/linksvc/linking.aspx?authtype=athens&genre=article&issn=1042-1629&volume=64&issue=2&spage=195&date=2016) - from EBSCO (Psychology and Behavioral Sciences Collection) |  |
| 16 | Original Article  **Virtual versus traditional classroom on facial traumatology learning: Evaluation of medical student's knowledge acquisition and satisfaction**  Journal of Stomatology, Oral and Maxillofacial Surgery  Available online 7 March 2020  In Press, Corrected ProofWhat are Corrected Proof articles?  Journal of Stomatology, Oral and Maxillofacial Surgery  Author links open overlay panel A. Morice a, b, c, E. Jablon c, d, C. Delevaque c, d, R.H. Khonsari a, b, c, A. Picard a, b, c, N. Kadlub a, b, c | <https://www.sciencedirect.com/science/article/abs/pii/S2468785520300446>  The high rate of absenteeism in the courses led us to offer virtual classrooms to better meet the expectations of students who may have geographical constraints. The objectives of this study were: to compare student's knowledge acquisition and satisfaction between virtual and traditional face-to-face classroom and to determine potential factors that may correlate with the level of knowledge acquisition following both type of courses. | See link |  |
| 17 | **ENGAGING PHARMACY STUDENTS: EXPERIENCING VIRTUAL**  **REALITY IN THE CLASSROOM AND CONNECTING GROUPS AND**  **COMMUNITIES WHO NEED PHARMACOLOGICAL ADVICE WITH**  **MOBILE APPS**  V.W.Y. Lee, P. Hodgson  The Chinese University of Hong Kong (HONG KONG) | <http://lib.uib.kz/edulearn19/files/papers/445.pdf>  Pharmacy practice goes beyond drug dispensing and prescription checks. More importantly, it is about  connecting patients and continuously performing medication reviews because patients’ health  conditions change over time [1]. This case study reports how a pharmacy educator redesigned the  curriculum so that students could gain both cognitive knowledge and awareness of the human side of  pharmacy practice through virtual simulation and connecting vulnerable people in the community.  Pharmacy students in the 21st century are used to learning with technologies such as notebook  computers, virtual reality devices and mobile applications [2]. Pharmacy students in Hong Kong have  much exposure to the use of mobile devices for communication with peers, and they are highly  encouraged to use mobile applications to find drug information and useful and reliable medical  references with medical mobile applications. However, because they have very limited opportunities to  know the communication and consultation process with doctors and patients, it would be a valuable  experience if they can experience it through immersion in virtual reality devices using their mobile  phones or notebook computers as preparation for clinical internships. A mobile application for e-health  support for patients is under development, and it will gather health records of individual patients,  information on drugs being prescribed and the pharmacist, and medical appointment data. These  students may be able to build a holistic conceptual understanding of medical support for patients from  hospital to being discharged into the community. | See link |  |
| **18** | **Assessing student acceptance of virtual classroom in higher education using the UTAUT**  B R Aditya1 and A Permadi2  Published under licence by IOP Publishing Ltd Journal of Physics: Conference Series, Volume 1254, 1st UPY International Conference on Applied Science and Education 2018 24–26 October 2018, Yogyakarta, Indonesia | <https://iopscience.iop.org/article/10.1088/1742-6596/1254/1/012053/meta>  In the era of e-learning, assessing student acceptance of virtual classroom technology is becoming increasingly important. This paper describes findings from a study of the acceptance of virtual classroom on Telkom University students, especially in D3 Informatics Management. Students from three different class were surveyed to capture their perceptions regarding their current virtual classroom systems. The assessment framework is based on UTAUT dimensions: performance expectancy, effort expectancy, social influence and facilitating condition, which consists of 14 variables. The conclusion of the study is that the use of the virtual classroom has had accepted on their learning activity, but with different levels of acceptance. This paper provides information that will be of interest to universities that are developing e-learning. | See link |  |
| 19 | **Virtual classroom use in short learning courses: An exploratory study**  Iwan Wopereis, Kees Pannekeet, Tom Melai | <https://research.ou.nl/en/publications/virtual-classroom-use-in-short-learning-courses-an-exploratory-st>  Contemporary virtual classroom (VC) systems are promising tools for teaching in online and blended learning programs. They offer practicable means to facilitate complex learning and (academic) enculturation. This study evaluates a free-of-charge short learning course (called ‘micro module’) for (aspirant) teachers and educationalists that introduces and promotes VC-use in present-day educational settings. Central to this short course were four one-hour VC-sessions that addressed (a) utility and usability issues and (b) topics related to (complex) learning and teaching in VC-environments. The sessions were distributed over a one-week period; each day both an afternoon and an evening version of a session were organized. Approximately 280 persons signed-up for the program. Between 5 and 10 percent of these subscribers took part in one or more VC-sessions. The recordings of the sessions were viewed around 160 times in total (count one month after the program ended). Relatively low numbers of participation and recording views question the return of investment of delivering a VC-rich short learning course. However, those participants who took part in the VC-sessions highly valued its content and structure (M=7.9; Mdn=8; Mode=9; ten-point scale). Especially the hands-on VC-experience was appreciated. Results further show that organizing non-compulsory VC-sessions at fixed moments leads to a low turnout in these sessions. High quality content doesn’t seem to affect that. Additional research is necessary to confirm these findings. | See link |  |
| 20 | Proceedings of the 1st International Conference on Applied Economics and Social Science (ICAESS 2019)  **Investigating the Interaction Patterns in EFL Virtual Classroom: A Case Study** | <https://www.atlantis-press.com/proceedings/icaess-19/125925921>  In this study, the interaction pattern between teacher and students in a synchronous e-learning system was analyzed. The study focuses on the initiation acts from both teacher and students. Three class-sessions of an EFL virtual classroom were recorder and the whole classroom talk then transcribed. The results suggest that teacher has more initiation acts, as the most dominated initiation acts is elicit the genuine questions in purpose of getting information from the students. This paper offers the preliminary discourse analyses as part of an examination of the value of virtual places for instructional design. | See link |  |
| 21 | **The Global Health Classroom: Collaborative Global Health Learning between New Zealand and Samoan Medical Students in a Virtual Classroom** (Thesis, Bachelor of Medical Science with Honours). University of Otago  Bothara, R. (2018 | [BotharaRoshitK2017BMedSc(Hons).pdf (3.298Mb)](https://ourarchive.otago.ac.nz/bitstream/handle/10523/8039/BotharaRoshitK2017BMedSc%28Hons%29.pdf?sequence=1&isAllowed=y)  Global Health is recognised as an essential component of undergraduate medical curricula to equip future doctors with the relevant knowledge, attitudes, and skills to practice in a globalised world. The Global Health Classroom (GHCR), the subject of this research project, has been developed at the Otago Medical School (OMS), New Zealand in collaboration with medical schools in Samoa and Nepal. The aim of the GHCR is to promote collaborative global health learning between medical students in different countries in a virtual classroom. In 2016, GHCR pilot studies were conducted between the partner schools and formed the basis of this Bachelor of Medical Science (Honours) Research Project in 2017.  In 2017, the GHCR was conducted between the OMS, Patan Academy of Health Sciences, Nepal (PAHS), and the School of Medicine, National University of Samoa, Samoa (NUS). Data collected from the GHCR participants at OMS and NUS were included in this thesis. At NUS, GHCR was integrated into the Year 4 and 5 medical curricula. At OMS, GHCR was integrated into the Year 5 Paediatrics Module at the University of Otago, Christchurch (UOC) and Year 4 Public Health Module at the Dunedin School of Medicine, Dunedin (DSM). | See link |  |
| 22 | **Effectiveness of virtual classroom training in improving the knowledge and key maternal neonatal health skills of general nurse midwifery students in Bihar, India: A pre- and post-intervention study**  [Nurse Education Today](https://www.sciencedirect.com/science/journal/02606917)  [Volume 36](https://www.sciencedirect.com/science/journal/02606917/36/supp/C), January 2016, Pages 293-297 | <https://www.sciencedirect.com/science/article/pii/S0260691715002920>  Quality of nursing-midwifery education and training is suboptimal in Bihar.  Students were trained in MNH skills through virtual classrooms.  Pre–post evaluation was conducted to evaluate the effectiveness of training.  Virtual platform was found effective in improving skills of nursing students. | See link |  |
| 23 | **Combination of a Flipped Classroom Format and a Virtual Patient Case to Enhance Active Learning in a Required Therapeutics Course**  Alicia Beth Lichvar, Ashley Hedges, Neal J. Benedict and Amy C. Donihi  American Journal of Pharmaceutical Education December 2016, 80 (10) 175; DOI: https://doi.org/10.5688/ajpe8010175 | <https://www.ajpe.org/content/80/10/175.full>  The combination of a preclass video lecture and an in-class virtual patient case was successfully developed and incorporated into a required therapeutics course at the University of Pittsburgh School of Pharmacy. This combined pedagogical strategy allowed for a customizable, personalized learning experience, while promoting higher-level learning. The availability of online video lectures allows students to individualize their learning pace and affords time to acquire on-demand knowledge of the foundational course material. Virtual patient technology provides a safe and comprehensive experience that engages students to assess patients, create treatment plans, and exercise problem-solving skills. Students embraced this technology as an effective way to understand and apply the materials from the video lecture. Furthermore, the instructors believe that this method promoted more student engagement and in-depth classroom discussion compared to that in the traditional, static case-based activity used in the previous year. The combination of preclass video lectures and a virtual patient case is a novel instructional design that can be successfully employed at other institutions and is well received by learners | See link |  |
| 24 | **Comparing Virtual Learning, Classical Classroom Learning and Blended Learning**  European Journal of Sustainable Development Research  2019, 3(1), em0072  Javed Iqbal Suleri 1\*, Anna Javed Suleri | <https://www.ejosdr.com/download/comparing-virtual-learning-classical-classroom-learning-and-blended-learning-3970.pdf>  This reading aims to compare the role of Virtual Learning (VL), Classical Classroom Learning (CCL) and Blended Learning (VL&CCL) in higher education. The literature review is presented in themes – Virtual Learning, Classical Classroom Learning and Blended learning. A quantitative method is applied in this study; data was obtained from 100 students from Erasmus University of Rotterdam by using an online questionnaire and convenient sampling. Questions were developed by the author and internal consistency and reliability were measured by Cronbach. The main findings illustrate that there was a significant relationship between gender and CCL, though, female respondents have more inclination towards CCL than their counterpart. Furthermore, VL has a significant relationship with CCL and Blended Learning. Thus, the intent of the learners to use blended learning in the future. Hence, this reading recommends educational institutions and educators to empower themselves with the use of technology, design their teaching methods as well as curriculum in such a way that the aim of that education is effective, efficient, convenient and approachable for all the learners at campuses as well as from distance.  Keywords: virtual learning, classical classroom learning, interactive learning, online learning, blended learning | **See link** |  |

# Appendix

## Sources and Databases

(HDAS databases, Google Scholar)

## Search Strategy

|  |  |
| --- | --- |
| AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO | (virtual classroom).ti |
| AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO | (virtual classroom).ti [DT 2015-2020] |

Searching the literature retrieved the information provided. We recommend checking the relevance and critically appraising the information contained within when applying to your own decisions, as we cannot accept responsibility for actions taken based on it. Every effort has been made to ensure that the information supplied is accurate, current and complete, however for various reasons it may not represent the entire body of information available.

# Help accessing articles or papers

Where a report/ journal article or resource is freely available the link or PDF has been provided. If an NHS OpenAthens account is required this has been indicated. If you do not have an OpenAthens account you can [self-register here](https://openathens.nice.org.uk/). If you need help accessing an article, or have any other questions, contact the Knowledge Management team for support (see below).

# HEE Knowledge Management team contact details

You can contact the HEE Knowledge Management team on [KnowledgeManagement@hee.nhs.uk](mailto:KnowledgeManagement@hee.nhs.uk)