

Teaching History in Ways C21st Students Learn – A Design-Based Research Perspective

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Abstract. One of the challenges of teaching current students' history is how to transform a generally boring subject to appeal to 21st century students. The continued use of traditional methods in teaching history by lecturers emphasizes recitation and narration. This makes student inactive. In this paper, we propose a model for teaching history using emerging technologies in ways that stimulate learners' interest and draw on historical contexts. Following the four stages of design-based research methodology, two iterations were designed and examined where pre-service teachers (C21st students) used multimodal affordances of emerging technologies (modern tool) to interrogate historical facts (history) in creative and engaging manner. The findings suggest that design principles and guidelines have potential to help students and teachers to restore interest in history teaching and learning while simultaneously guiding and interpreting the human past. A major outcome of this research was the development of five major design principles and guidelines for teaching history in ways that C21st students learn - connecting with the present, appreciating heritage, dialogue in history, doing history and validating history.

Keywords: History Education; Emerging Technologies; Design principles; Salmons 5-stage model

1. Introduction

While history is a core subject at Ordinary level among secondary schools in Uganda, the discipline will only become a compulsory subject in South African Schools in the year 2023 (Nussey, 2018). However, the current state of History education around the world, particularly in Africa, consistently indicate a predominant use of traditional methods of instructional approaches (Barbosa, 2018; Rifin, Awang, Ahmad & Dahalan, 2019). This is reflected in narrations, constrained dialogue between students and educators, wide-content coverage

drawn primarily from textbooks and focused on passing examinations (Sebbowa & Muyinda, 2018; Benvato & Wassermann, 2018). History education is continuously threatened, as it does not always relate to the C21st (21st century) students, who often find learning history pointless with limited importance to the present day job skills and demands. This implies that, teachers need to diversify into C21st teaching and learning methods that focus on major skills such as: historical thinking, collaboration, historical consciousness, communication, digital skills and creativity (Rifin, Awang, Ahmad & Dahalan, 2019). In this paper, we propose a model for teaching history using emerging technologies in ways that stimulate learners' interest and draw historical contexts in relation to the contemporary situation.

A recent study that engaged with Kahoot in a history classroom reports that students were more excited to learn history when a technological tool was introduced (Brims, 2019). Brims concludes that the use of a gamified quiz in the classroom also engaged learners. While there is an increase in the number of Emerging Technologies (ETs) for teaching history, there is paucity of resources with specific focus on C21st students and African history.

ETs are digital artifacts, tools, concepts and innovations associated with a disruptive potential to transform or generate changes to serve emerging practices in discipline-specific educational contexts (Velestianos, 2016; Sosa, Salinas & De Benito, 2019). Examples of such ETs are blogs, wikis, skype, face book, zoom, mobile phones and WhatsApp that emerge according to particular contexts. In this paper, we draw on ETs, particularly wikis in teaching and learning of history to serve a discipline-specific purpose of mediating dialogical conversations between educator and students.

2. Literature Review

There is growing evidence supporting the use of ETs in history pedagogy. Researchers such as Aying, Awang and Ahmad (2019); Syaripuddin, Ahmad and Awang (2019) revealed that the Digital Game Based Learning (videos, video games and computer games) model fosters history learning with an entertained experience as opposed to the memorization and recitation of history facts reminiscent in history classrooms in Malaysia. Similarly, Virtual reality was used in teaching history among Primary Education learners in Spain. The results revealed that ETs afford comprehension of some cultural and artistic manifestations in history and arouse interest and motivation in a positive way in contrast with course boards (Villena, Cózar-Gutiérrez, González-Calero & López, 2019).

Subsequently, Sebbowa and Muyinda (2018) found that, mobile phone technologies enhance interactions between lecturers and students, students and students and provide a helpful precondition for collaborative learning and reflection about the human past. Consistently, Miguel- Rerilla, Martinaz-Ferreira and Agusti (2020) carried out a study aimed at examining whether the TPACK model, and specifically a version based on 21st century competences, is a coherent and useful assessment tool for analyzing the acquisition of digital competence in social studies prior teacher training. Prospective teachers created

an online platform based on the implementation of a learning management system (Moodle), and a content management system (Drupal) where the results indicated a commendable progress towards competence after the assessment. However, these authors did not look at the possibility of using ETs to address the persistent use of teacher-centric pedagogies in history classrooms that have resulted into passive learning and loss of interest in History Education. We argue that, the developing a model inform of design principles for teaching history can be relevant in guiding learning activities mediated by wikis (ETs).

Wikis are interlinked web pages that allow multiple authors to collaboratively store add and edit content as well as invite dialogical conversations between teachers and students (Samalieva, 2018). Wikis are particularly relevant to this paper because they contain an affordance function of preserving history versions and of tracking changes through evolution and progression of raw concepts and ideas (individual interpretations) into shared understanding. Moreover, wikis facilitate fostering and sustaining collaborative versions of history from which meanings can be continually edited, iterated and revised through a dialogic process of validated meanings as well as promoting students' initiative in problem solving (Medero & Albaladejo, 2020). Wikis enhance students' interest in history through interpreting images, videos and pictures as representations from the past. These created historical artifacts might be sustained and transferred from one generation to another. This therefore implies that, wikis have the potential to mediate conversations between the past (relics left) and the present (students and educators).

However, studies conducted by Alghasab, Hardman and Handley, (2019); Fisher and Allred, (2020) revealed that, wikis are not inherently collaborative even though they possess features that facilitate collaborative writing and learning. They proposed that greater teacher scaffolding, orientation, guidance on use and incentives to edit and add content, would be useful for successful implementation of wikis for pedagogical purposes. Moreover, Ismail, (2020) recommends that, educators stay updated with technology and encourage students to engage in collaborative creation of content. Correspondingly, wikis have been recommended as user-friendly support tools that enhance collaborative learning and knowledge construction among teachers- peers and peers -peers while they stay home during the COVID-19 era (Huang, Liu, Tlili, Yang, Wang, 2020). Accordingly, Huang et al argue that ETs can afford flexibility in learning while simultaneously addressing the challenge that students cannot go to campus and study in a regular way.

Salmon's five-stage model

Salmon's five-stage model was used as a model to support ET. The rationale for engaging with this model was firstly to; illustrate how participants in the wiki can benefit through dialogue, networking and collaboration. Secondly, to highlight the roles of the educator and student at each stage with an aim of enhancing learning (Wright, 2015). Salmon's five-stage model is a strategic approach to structuring course content and conversations on the basis of a natural stage-by-stage progression that a student is likely to go through in online

learning (Wright, 2015). Salmon's model (2002, p.180), also known as the progression five steps, includes "access and motivation, online socialization, information exchange, knowledge construction and development." At each of those stages, there are proposed activities to ensure dialogue and conversations between the educator and students to promote insightful learning. In the context of this paper, educators and students have the potential to engage in a collaborative dialogue mediated by wikis that can lead to collective construction of history.

Previous studies by Kovacic Bubas and Zlatovic (2008); Su and Beaumont, (2010); Salmon, Nie and Ediringha, (2010); Wright, (2015) and Ruzmetova (2018) show that Salmon's five-stage model provides existing draft principles for dialogue and interaction in online pedagogical processes by highlighting how an educator scaffolds learning and the role of students in the process. Particularly, Ruzmetova (2018) demonstrates a deep analysis of using Gilly Salmon's five framework in the development of an initial short blended course for master's students at Uzbekistan State World Languages University. In this paper, the design principles were shaped by Salmon's five-stage model because of its procedural structure on utilizing a learner-centered pedagogy (Kovacic, Bubas & Zlatovic, 2008). Design principles are re-usable guidelines for others wishing to create their own solutions to educational problems across sectors (Herrington & Reeves, 2011).

Salmon's five-stage model (Salmon, 2002) has been proposed as design principles to ensure appropriate online educator scaffolds and technical support while also illustrating students' roles of increased independence and self-directed learning (Korhonen, Ruhalahti, & Veermans, 2018). For example, Kovacic, Bubas and Zlatovic (2008), and Wright (2015) investigated the use of Salmon's five-stage model (e-tivities) in writing English as a second language and designing Community Inquiry course components on wiki platforms respectively. Findings revealed that, the five-stage model (e-tivities) highlighted systematic educator and learner roles as well as a solid framework for deeper engagement with English writing content and appropriate designs for the course components. Although the above studies reported the potential benefits of engaging with Salmon's five-stage model for structuring content and interaction on the wikis, none of them refined Salmon's five-stage procedural steps to design principles that enhance dialogic teaching and learning of history.

Theoretical Framework - Historical Hermeneutics

Hans Geog Gadamer (1900-2002) developed historical hermeneutics theory. Historical hermeneutics acknowledges that understanding is shaped by past reflected in the students' experiences of being in the present world (Gadamer, 2004). Thus, the historical hermeneutics philosophy agitates for movement beyond our individual isolations by asking questions to break through closed opinions, preconceptions and the unknown (Risser, 2015). The key concept of dialogue through openness to meaning is translated from *bildung* in German, which means keeping one's self-open to what is the other, and detaching ones' self from one's immediate desires and purposes (Ibid, 2015). Gadamer argues

that the achievement of this openness is precisely what is enacted through dialogue of question and answer, as the art of questioning is the art of thinking that takes place in dialogue (Risser, 2015, p. 337). Consistent with the Gadamerian views expressed above, the educator and students engaged in shared dialogical conversations of history meanings mediated on the Wiki. Historical hermeneutics alludes to understanding as a unity of shared dialogue by listening to the other's voice. This is reflected in sentiment: *'If there is dialogue, the relationship must be reciprocal and each must be prepared to listen to what the other has to say.'* (Gadamer, 1989, p. 205).

In this paper, we closely align with historical hermeneutics, which aims to understand how human actions (between students, peers and educators) share interpretations of history meanings when mediated on a Wiki. Dialogical conversations between educators and students focus constantly on attaching multiple meanings to the past through the lens of the present mediated by Wikis. Closely linked to the Historical Hermeneutics, the Design Based Research (DBR) methodology employed in this study agitates for corroborations with multiple sources, experts and novices, as a means of validation and critique by other people aimed at obtaining true meaning (Lambert and Jacobsen, 2019).

Thus, we engaged with the DBR Methodology to propose a systematic structure as an approach for supporting dialogical conversations between students and teachers mediated by ETs. This was guided by the key research question: What design principles guide history teaching with emerging technologies of C21st students?

3. Research Methodology

Design Based Research (DBR)

DBR is a systematic methodology aimed to create research-based solutions to authentic problems in the educational practice through implementations, based on collaboration among researchers and practitioners, leading to contextually sensitive design principles (Wang & Hannafin, 2005). The rationale for engaging with DBR in this research was for two reasons. Firstly, DBR methodology (educational domain) was viewed appropriate for the current research as it proposed an intervention that would work in an authentic learning environment to address the research challenge in history education. Secondly, DBR methodology is a viable approach in designing interventions to solve real problems in students' everyday life with grounded theoretical underpinnings (Papavlasopoulou, Giannakos and Jaccheri, 2019). Given that, DBR is typically context bound. A wiki intervention applicable to the Ugandan context was designed tested and re-tested at the Makerere University, School of Education. That said, the proceeding section presents the four phases of DBR that guided this research coupled with observational findings at the respective steps.

DBR consists of four phases that ensure a systematic research process, with each phase informing the other through a cyclic and iterative process of refinement of problems, solutions, methods and design principles (Reeves, 2006).

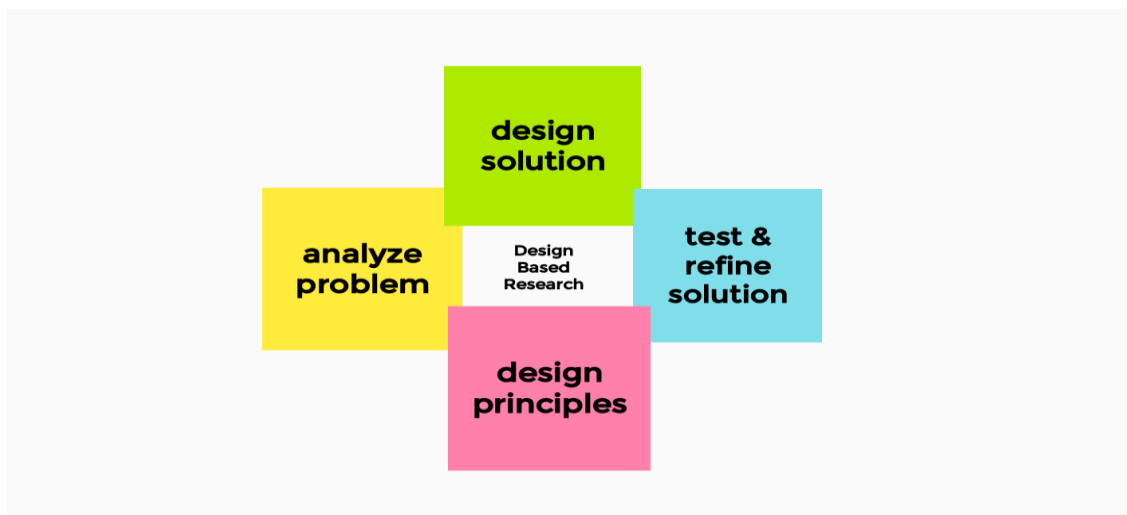


Figure 1: Four Phases of DBR (Adapted from Reeves, 2006)

DBR Phase 1: Analyze problem

As already stated in the introductory section, the dominant use of teacher-centric methods results into anti-dialogue and disengagement in history education. Thus, C21st learners seem unimpressed with teachers' didactic approaches (Lambert and Jacobsen, 2019) that limit their active participation. This is exacerbated by the perception that learning history is pointless and insignificant to their contemporary needs. Perhaps the question that educators could be grappling with is; how can history be taught to attract C21st authentic learning approaches? In cognizant of other methods of teaching history, we proposed an innovation of learning through blended ETs with a possibility of enhancing dialogue between educators and students.

Informed by the DBR phase 1, we needed to redefine our understanding of the problem by interacting with practitioners. To this end, informal consultations with practitioners, history teachers, teacher educators and a curriculum expert from National Curriculum Development Centre. The consultations with practitioners were particularly relevant because experienced personnel suggested possible solutions to the problem given that they faced similar pedagogical challenges on a daily basis. Through informal interviews and collaborations with practitioners, the problem was refined and analyzed with new horizons in two ways. Firstly, that history was/is being taught with limited or no shared dialogue between students and teacher, and that learning will continue to dissipate from one generation to another. Secondly, that there is a need to obtain multiple perspectives about the past mediated by ETs to capture the way 21st century students learn.

DBR Phase 2: Design Principles

As a continuation of the DBR phase 1 above, solutions to the research problem were developed by consulting literature on how similar problems had been addressed. This focused on historical hermeneutics theory and existing design principles. Salmon's five-stage model provided the existing design principles for mediating effective dialogical conversations (hermeneutical construct) between the educator and students on a wiki. Consequently, a wiki was designed as a

technological innovation customized to Salmon's five-stage model (reflected in the preceding sections) with a focus of addressing the identified problem. The choice of wikis as an innovative intervention was informed by its affordance of preserving and fostering shared conversations of history understandings from which meanings can be continually edited, iterated and revised to attain authentic understanding. Having designed a wiki and engaged with Salmon's five-stage model, the next focus was on DBR phase 3.

Phase 3: Test and refine solutions

The importance of DBR phase 3 was to implement, test and evaluate an intervention (wiki) in practice at the Makerere University authentic context. Consequently, the design intervention was implemented through three iterative cycles in which design principles were refined to improve practice. In the next section, we reflect on the implementation of the Salmon's five-stage model captured in two implementations with diverse participants.

Implementation 1

Participants' selection

The participants were pre-service teachers (C21st students) in their third year of study taking history as one of their teaching subjects at the School of Education, Makerere University. Consequently, each cohort of participants was informed that recruitment to join the wiki platform was voluntarily on a free entry and exit basis. Thus, participants were free to join the platform and free to leave at will. Those willing to join the platform had to register their names, emails and mobile contacts to participate in the research for strictly research purposes. Volunteered participants were requested to attend a face-to-face orientation workshop scheduled at the Computer Laboratory, School Of Education, Makerere University.

Eight participants from the history methods class volunteered to take part in the ET integration in history project. It is more likely that volunteer participants had internet enabled ICT tools, required skills and interest in engaging with ICTs for pedagogical purposes. The participants unanimously agreed to discuss the topic; "Manifestations of Neocolonialism in Uganda" citing that they were all experiencing its manifestations in their present lives and that it was topic covered in the secondary school history curriculum. Thus, the impact of the introduction of ET might be tested during school practice where pre-service teachers practically engage with ETs in the actual teaching.

Data findings and Analysis

In the DBR methodology, all stages, from the analysis to the development of design principles, include interactive and iterative formative evaluations. From the beginning of the cycles' implementation, starting with the design, to the execution and evaluation of each workshop, the researchers and instructors were in constant collaboration (Papavlasopoulou, Giannakos & Jaccheri, 2019). We engaged with thematic analysis greatly informed by the historical hermeneutics key constructs such as dialogue.

Salmon's five stage model implemented and customized to History

Table 1: Formulated design principles from Salmon's five Stage model

Salmon's five stage model-design principles	Substantive emphasis Characteristics	Procedural emphasis Method
Access and motivation	<p>Improve digital literacy skills by <i>playing around with the user interface to access Wiki site.</i></p> <p>Blended learning</p> <p>Collaboration</p> <p>Group identification of a history topic of interest by linking to the students' interests</p>	<p>The Researcher: Asks participants about their access to computers, mobile phones and internet facilities. Creates a protected Wikispaces site. Sends invitation emails to participants from Wikispaces. Welcomes, motivate and guides participants through obtaining technical support. Sends out SMS, email invitations for a face-to-face orientation meeting.</p> <p>The participants: Sign into Wikispaces site Familiarize with the Wikispaces. Attend the face-to-face orientation meeting.</p>
Online socialization	<p>Providing online identities</p> <p>Authentic task</p>	<p>The Researcher: Tasks participants to introduce themselves by name and year of study. Guide and direct participants on accessing the pre-engagement task (Preconceptions of History Education in Uganda). Sets an authentic pre-engagement task.</p> <p>The participants: Introduce themselves by name and year of study. Access and engage with the required task. Post and share views on preconception task, comment and respond to peers.</p>
Information Exchange	<p>Exchange of historical texts, pictures and images</p> <p>Open questioning & answering</p>	<p>The Researcher Facilitates questioning and answering on the meaning. Ask participants to get in to groups of two and identify a history topic.</p> <p>The participants: Brainstorm and unanimously agree on the history topic of interest. Share history texts, pictures and images on the agreed upon topic of interest. Question and obtain responses on the texts, pictures and images.</p>

Knowledge construction	Support collaborative construction of history meanings.	<p>The Researcher: Guides participants to collaborative construction of knowledge. Facilitates the exploration of multiple sources of evidence. Presents an authentic task.</p> <p>The participants: Explore multiple sources of evidence to obtain history interpretation. Attempt the authentic task Collective negotiation of the history meanings.</p>
Fostering development	Linking the past to the present	<p>The Researcher: Tasks participants to reflect on their lived experiences of learning history</p> <p>The participants: Share their experiences by linking the past to the present</p>

Table 1 above is substantiated in procedural steps as follows:

Step 1: Access and motivation

Step 1 was conducted through three stages. Firstly, after successfully designing a wiki and posting a welcoming message to the participants as a way of initiating and inviting them. The rationale for posting a welcoming message was to recruit participants understanding about why they are learning in this way, as well as what they had to do to take part in the online activities (Salmon, 2011). Secondly, sending out invitation emails from the wiki and requesting participants to sign up and create their own accounts. Thirdly, to enhance blended learning; invitation of participants for face-to-face meetings to afford physical socializations, clarifications, and instant feedback. Observations were an appropriate strategy to provide direct experiences of how participants accessed the wiki. The participants would receive instant communications and notifications from the wiki about any updates.

Out of the eight participants, seven were able to access the wiki using various means and avenues such as their mobile phones, desktop computers: through guidance from the educator, face-to-face orientation workshops and peers. Participants were able to introduce themselves by writing their names and years of study. Therefore, step 1 of access and motivation were largely successful. Although most of the participants gained access to the wiki, there were some challenges recorded in the written interview. For example, one participant highlighted a need for further guidance on where to obtain technical support. Technical support was earmarked as relevant and significant for the success of online learning (Ismail, 2020).

Similarly, it was observed that more time and online space should be created on the wiki to enable participants easily to play with the user interface and acclimatize themselves with the online environment.

Step 2: Online Socialization

Online socialization involves building online confidence and ease of interaction. Thus, participants were requested to contribute to the pre-engagement task by introducing themselves hence posting their names and year of study. Online introductions were deemed important to build solid online identities, networks and friendships that would later support collaborative learning (Salmon, 2013). To a larger extent, the focus of online socialization among participants was achieved, yet the lesser extent should not be ignored. For example, it was earlier observed that some participants (three out of eight) did not engage with sharing their online identities. This could have been due to the voluntary participation on the wiki, perhaps another explanation could be that participants were not motivated to participate online. Therefore, this observation served as a basis to inform the refinement of online socialization at implementation 2 in the proceeding section.

Step 3: Information Exchange

Step 3 was characterized by activities, exchange of historical texts, pictures and images, open questioning and answering. Such characteristics or activities were to be evident on the wiki. Participants engaged with the topic, *Manifestations of Neocolonialism in Uganda* on the wiki. Subsequently, viewed through online observations, participants made online contributions on the concept of neocolonialism in Uganda while others shared pictures exhibiting their understanding of the Manifestations of Neocolonialism in Uganda. The argument developed in this paper is that the process of attaching meaning to the past through sharing of pictures and photographs provides a form of innovative approaches to learning and reconstructing history through the lens of the present. Thus, to substantiate the above statements participants engaged in an online discussion on neocolonialism in Uganda.

Participants interacted with each other and exchanged ideas about the concept of neocolonialism in Uganda, the Salmon's step five; information exchange was to a larger extent successful. To this end, Salmon (2002) argues that, information exchange is deemed successful when participants learn how to search and exchange information productively through e-tivities. However, it was to a lesser extent successful in that, there were limited uploaded pictures and images on *Manifestations of Neocolonialism in Uganda*. Hence, this was documented under lessons learnt and recommendations.

Steps 4 & 5: Promote Knowledge Construction and Foster Development

Following the successful implementation of Salmon's steps 1, 2 and 3 presented above, the expectation was that participants would begin to work together on the active co-construction of knowledge through dialogical interpretation of history meanings at the steps 4 and 5, to promote knowledge construction and to foster development respectively. However, this level of engagement was not reached. This paucity could be explained as a challenging move from information exchange, to knowledge construction, onto development that required a longer period for the participants to become comfortable with being open-minded and critically reflective of their own views and positions. Given that the DBR approach employed in this paper places emphasis on iterative

cycles of re-testing and refinement of design principles, this was not effectively implemented (Herrington et al., 2009). Steps 4 and 5, knowledge construction and development would be executed and re-tested at implementation 2.

Lessons learnt from Implementation 1

Salmon's five-stage model is to be re-worked and customized to history pedagogy. The potential of this step is the dialogical conversations informed by the Historical Hermeneutics evident at information exchange. That said, Implementation 2 was to be effected within a longer period. This was relevant in engaging the researcher and participants in construction of history meanings mediated by the wiki. To suit the DBR approach employed in this paper, different cohorts of participants were used. The rationality for the different cohort of participants was to ensure that the conclusions adequately represent the entire range of variation that could be generalized to similar contexts of Public Universities in Uganda.

Implementation 2

Participants' selection

These cohorts of participants were pre-service teachers who took history as one of their teaching subjects. Following the lessons learnt in preceding section, the small number of participants (eight) may have limited the findings, as some students did not ably engage in collaborative construction of history meanings. To that end, Herrington and Reeves, (2011) argue that at the second implementation a different group of students is often used considering the different years of study and the different times at which the course runs. Subsequently, 20 participants voluntarily joined the wiki comprising of three PGDE students, eleven second-year students and six third-year students. Consequently, participants were informed that recruitment to join the wiki platform was voluntarily on a free entry and withdrawal basis. Thus, using diverse groups in DBR adds value and enables a critical analysis of the history content materials, as these can identify issues with the design prior to the final design principles (Akker & Nieveen, 2017).

Step 1: to access and play

Salmon's step 1 'Access and motivation' was renamed 'Access and Play' so as to customize it to the history pedagogy local context. The argument for access and play was to provide an ongoing support to participants to gain access and to motivate and arouse participants' interest. Thus, a play page on the wiki that had no structured ground rules, where participants could obtain access and learn how to use the wiki environment through trial and error was created. In this paper, we conceptualize play as an open, free practice for gaining confidence in the wikis intervention without a set ground rules and procedures to follow (Fairfield, 2015). We realized that, to access and play, was closely aligned to the study problem of teacher-centric approaches reminiscent in history pedagogy which limit the art of dialogical conversations about the past. This was followed by the educator's task that required participants to engage with Access, play page, and familiarize themselves with learning on the wiki. The educator further cautioned participants that this was a trial, play and fun page and that nothing was to be taken seriously. In response to the educator's

task, participants tried out several encounters and trials of making postings, uploading images and videos. Observational findings were further coded and categorized into themes: History Education dialogue, and Fun and Play dialogue. Out of the 20 participants, 10 were themed under History Education dialogue while the remaining 10 fell under the category of fun and play dialogue as reflected in table 2.

Table 2: Participants' activities at step 1-Access and Play

Educator's task/activities	Participants/ students' activities	Description of activities and themes arising from data	No. of participants out of 20	Representative comment	
Uploads a PBwiki video and userguide. Uploads a play picture for History time lines. Tasks participants to familiarize themselves with the PBusser guides	Refers to the PBwiki userguide & video for guidance	Compliments from the questionnaire and interview revealed that participants referred to the PBusser guide for guidance		No representative comments captured	
Cautions participants that this was a trial play page and nothing was to be taken seriously on this page Supplemented participants' posts	Engaged with trial sessions of uploading pictures/ images	Five trial images uploaded (images from the historical artifacts and the present (family pictures))	3 participants uploaded trial images	No representative comments captured	
	Played and had fun at Access and play page Made dialogical conversations of questioning and responding to each others' questions with complements from Educator	Students' activities coded and categorized into two themes:			Three representative comments from each theme
		History education dialogue	10 participants engaged in History related dialogue	'I would like to know whom historians regard as the mother of history.' (C1)	
		Fun and play dialogue	10 participants engaged fun and play dialogue	'Hi friends, I am seeking for advice in a project am starting in my village. This shall cover basic aspects like enabling my community to apply historical knowledge to solve some problems like; conflicts in my community so dear friends advise me.'(C10).	

Following table 2, two extract examples that represent the illuminated observational themes are analyzed:

Observational analysis example 1

Theme: History Education dialogue

Extract: *'I would like to know whom historians regard as the mother of history' (C1).*

Explanation: The student created a dialogical question, which seemed funny but required an answer. For example, she used the phrases and words, 'whom historians regard as the mother of history'. Teachers and educators always teach about Herodotus (484-425 B.C), an ancient Greek historian as the father of history who spearheaded the world's first piece of historical writing known as historians. It was quite funny that the student inquired about the 'mother of history'. Such a question could yield into endless probing and multiple interpretations that explain the fact that there is no one right answer in history.

Theme: Fun and play dialogue

Extract: *"Hi friends, am seeking for advice in a project. I am starting a project in my village. This shall cover basic aspects like enabling my community to apply historical knowledge to solve some problems like; conflicts in my community so dear friends advise me." (C10)*

Explanation: The above statement is indicative of the student's need to use history knowledge to solve a problem in the present. The student uses the phrase, 'enabling my community to apply historical knowledge to solve some problems like; conflicts in my community'. This statement was deemed relevant because, it linked educators and teachers to students' thinking in the present where the student sought advice from 'friends' to solve challenges in the present, 'conflicts in the community.' The statement suggested that dialogical construction of history meanings could potentially become an interesting, exciting and fun learning activity mediated by wiki. This view partly provides a solution to today's students who find learning about the past boring. Therefore, the historical hermeneutics construct of dialogue in history was evidently manifested at step 1.

Step 2: to promote online introductions

The argument for promoting online introductions was driven by the desire for participants to introduce themselves and identify with each other on the wiki site. This was achieved through sharing names, year of study and making posts/images of something about their culture/family history. The rationale for sharing their cultures was important in making them feel part of their own history, family and tradition. To this end, Seixas, (1996) argues that family history gives students a chance to learn about the past in a way that is meaningful to them as it connects to their lives.

All the 20 participants shared their online identities and highlights about their family history by mentioning tribe, origin and something significant about their culture, while only seven uploaded images about their cultural history. Two reasons are highlighted for the small number of image uploads as follows. Firstly, this could be because some participants felt shy to upload family history images. In some instances, especially in Africa, sharing of images of the family lineage on social media may not be allowed. Secondly, some cultural relics

(representations of the past) are not available in electronic format. Therefore, observational findings suggested that participants shared online identities and family histories for ease of interaction and understanding each other on the wiki as reflected in table 3 below.

Table 3: Participants' activities at step 2: to promote online Introduction

Educator' activities/task	Students' activities responses in themes	Description/ student responses in themes arising from data	No. of participants out of 20	Qualitative representative example
Asks participants to introduce themselves by stating their name, year of study, teaching subjects	Introduced themselves	Online identification	20	<i>Hi, I am xxx a third year student at Makerere university pursuing bachelor of arts with education. My teaching subjects are history and Christian Religious Education. I am a Mugwere by tribe from Kibuku district (C9).</i>
Tasked to share something interesting about their Family History Make written texts/upload pictures, images of their family history.	Share a highlight about their family history and some uploaded cultural images and picture			
Supplements students' questions and responses on family history	Peers welcome each other on the Wiki learning platform comment, question and respond to each other	Family history highlights	20	<i>Hullo everyone, I am xxx, offering BAED and doing History and Religious Education. I am a Samia by tribe from Eastern Uganda (C10).</i>
		Shared images about culture	7	<i>I am a muganda by tribe and I love my culture so much. I share some of the pictures from Buganda and the Katikirro of Buganda (C11).</i>

Step 3: to make shared interpretations of history meanings

To make shared interpretations of history meanings was created with a rationale of enabling collaborative construction and interpretations of history meanings. Importantly, this principle is aligned to the link of exchanging history artifacts through pictures, images and audios. Thus, this step was achieved through reading and consulting multiple sources of history information, such as journal articles, newspaper extracts, video clips, pictures and images about the suggested topic under study. Participants would analyze all the information from the historical sources, post their interpretations and receive comments, questions and responses from their peers with supplements from the educator. Thus, step 4 would be successfully accomplished if participants engaged in doing history through active engagement of sharing history meanings to reach understandings afforded by the wiki. Out of the 20 participants who engaged with the principle of making interpretations of history meanings, 7 shared cherished cultural values, 7 revealed that, they appreciated culture and heritage, while, 6 indicated that cultures can be preserved to the present.

Table 4: Participants activities at step 3: making interpretations of history meaning

Educators' activity	Students' activity	Description/ Students' responses in themes	No. of participants out of 20	Salient comments
Tasks participants to something significant/interesting about your family/cultural history	Shared interesting family/cultural history	Shared cherished cultural values	7	I have just realized that cultures have specific values; I really cherish my culture. For example we visit the bush and elongate the labia (B14)
		Appreciating culture and heritage	7	When one shares his family history, it enables one to appreciate his culture and heritage and compare with other cultures (B9)
Tasks participants to give reasons for sharing their family history	Transition of cultures to the present	Cultures provide a sense of belonging and identity		
		Preservation of culture to the present	6	I feel part of history when I describe, appreciate and write about my culture it's a way of keeping and preserving it (B2)

Following table 4 above, the hermeneutic cycle-driven analysis was employed to analyze examples of excerpts following a procedural process of theme, text and explanation.

Analysis Example 1

Theme: Cherished cultural values

Text: *"I have just realized that cultures have specific values; I really cherish my culture. For example, we visit the bush and elongate the labia in preparation for sex in marriage while people from the Sabinian culture cut the clitoris women off" (B14).*

Explanation: B14 appreciated the diversity and uniqueness among cultures while also expressing great interest in her own culture. For example, she used the words and phrases such; *"I really cherish my culture' and went on to provide an example of the cherished cultural practice"*.

She also gave an example of diverse cultural practice practiced by another ethnic group Sabinian culture, "cutting the clitoris" in preparation for marriage. This is relevant in History education as students relate to their lives and peers' life, which makes them see themselves in the academic version of the history discipline.

Analysis Example 2

Theme/subtheme: Appreciating culture and heritage/ preservation of culture

Text: *"I feel part of history when I describe, appreciate and write about my culture." It is a way of keeping and preserving it (B2)*

Explanation: B2 attached relevancy to history and therefore adhered to preserving it. This was reflected in the student's words: *"I feel part of history when I describe, appreciate and write about my culture" it's a way of preserving it.* These statements were analyzed in two ways: firstly, feeling part of history reflected a self-conception of belonging to tradition thus relating to one's identity. Secondly, there was an expression of a need to preserve "such a tradition, which is pertinent in History education. These sentiments suggest that, if students are taught history in relation to their own life, they will definitely find the relevancy in learning about the past. History Education ought to engage students and educators in dialogical conversations about each other's lives, for example, sharing stories about each other's culture such that, through multiple interpretations meanings are validated (valid history).

Step 4 & 5: to support open questioning and clarifications

The argument for creating step 5 - 'to support open questioning & clarifications' - was to engage participants in an open inquiry, comment and respond to each other's posts while receiving supplements and clarification from the educator/researcher. This was envisaged to enhance the collective interpretation and understanding of history meanings hosted by the Wiki. Thus, questioning and responses were intended to help participants see history as issues still being inquired and deliberated on by historians, rather than facts that could not be revised (Maloy, Poirier & Smith, 2010). The DBR methodology postulates that, after the first and second implementations of the solution, the learning environment is refined, design principles renamed and then implemented again (Reeves et al., 2005).

Given that the desired outcome of the DBR approach was the creation of design principles customized from Salmon's Five Stage model the research question was: what design principles guide the teaching and learning of history using emerging technologies? The responses were obtained from a reflection of the design principles procedural steps as summarized in figure 6 below.

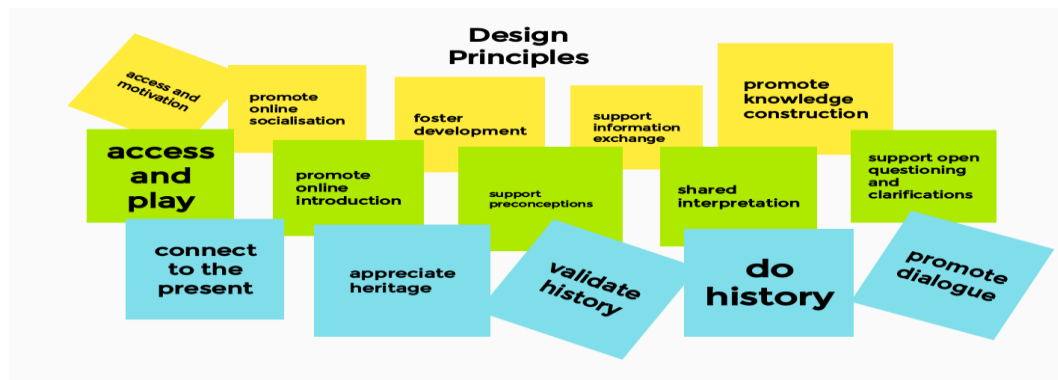


Figure 2: illustrating Design Principles refined from Salmon's five-stage model

From figure 2 above, all the sticky notes representing design principles- touch each other somewhere. This suggests that, no design principle stands in isolation - they are interconnected. Importantly, the design principles are refined and progress through a consecutive process from one-step to another.

The validation process of each design principle was achieved through documenting the reflection of what was successful and what failed so that it would be re-tested in at implementation 1 and 2. Thus, the change in names of the design principles was guided by the findings at each implementation. Moreover, the names adopted for the final design principles were obtained from dominant words, phrases and themes in the study findings. Therefore, in response to the key research question of the paper: what design principles guide history teaching with emerging technologies of C21st students? Design principles generated were; to connect to the present, to appreciate heritage, to validate history and to promote dialogue in history.

DBR Phase 4: Design Solution

One of the main outcomes of the DBR approach is the development of design principles and recommendations to guide both theory and practice in specific educational contexts (Pais Marden & Herrington, 2020). After the implementation and evaluation of the proposed solution, Salmon's five-stage model guided the design of the solution through analysis and reflection, revision of principles to produce final design principles for teaching history using ETs as discussed below.

4. Discussion of findings

The refined designed principles provide the pillars for defining a robust environment for teaching history in ways that C21st students learn. In this discussion, each of the five principles are revisited.

One: Connecting to the present

In connecting to the present, a history teacher or educator should first find out if every student has access to computer devices and the internet. This could be achieved through sending out a survey to find out which type of access learners have in their particular contexts. Moreover, Access and play enables students to harness the wiki (or any ET) to log in, play around, and become orientated to learning with others. Students' participation through play is very important as it motivates and arouses their interest to stay on line (Salmon, 2013). Teachers normally assume that students will continuously participate but if the activities are not enjoyable and are too structured, they will not participate. However, teachers should note that this can take some time, as access has proven to be a challenge in online learning environments (Korhonen, Ruhalahti & Veermans, 2018). The principle of connecting to the present is vital as it implies that, if C21st students are to participate in interpreting history they need to be acquitted with information literacy skills to afford access to ET tools and internet connectivity.

Two: Appreciating heritage

In appreciating heritage, the history educator or teacher encourages students to introduce themselves and share something about their family history that interests them. The rationale behind 'appreciating heritage' is to ensure that students feel part of history and identify with the past through sharing their cultural history (students share personal stories about their families). Correspondingly, appreciating heritage affords student development of C21st skills such as; historical thinking and historical consciousness based on evidence from multiple sources of the past. This is relevant as it allows students to express how they understand the past from the inferences they make from sources and to become aware of their orientation in historical time (Carrasco, Martinez, Fontal & Etxeberria, 2020).

Three: Validating history

In validating history, the role of the educator/teacher is to scaffold the learning process by tasking students to read a variety of history texts while taking into consideration (exhibiting awareness) of the authors' intentions, context and time in which the texts were written and share this information mediated on the wiki. In congruence with this view, Carrasco, Martinez, Fontal and Etxeberria, (2020) assert that History Education should absolutely aim at helping students explore and interpret multiple perspectives about the past, stimulate student's historical thinking and enable acquisition of historical knowledge. Indeed, the teacher's role at this step is to scaffold and respond to questions, supplement students' responses and motivate learners by providing feedback. For example, during the COVID- 1 lock down, validation of the shared ET or social media texts, videos and audios was achieved through official communications from the World Health Organization, Ministry of Health, Uganda and Ministry of Education and Sports (MoES, 2020) for Educational related issues.

Four: Dialogue in history

Dialogue in history is informed by the historical hermeneutics construct of dialogue (Gadamer, 2004) through open questioning and responses between the

educator, students and course content. Therefore, under this principle, students engage in dialogue and make meaning to the history content shared by asking for clarifications and questioning in form of the conversations between the past and the present as mediated by the wiki. For example, in the contemporary COVID-19 era in Uganda. While, educational programs for primary (social studies) and secondary school (history) are currently aired on television and radio stations, the teacher is the sole dispenser of knowledge as students listen and note down issues arising out of the lessons. This is seemingly constrained with no interactivity and collaboration between teacher-student, student-student, as students' questions are never answered. The only feedback or comments on the lessons aired is given to teachers or head teachers through sending SMS, WhatsApp, emails or writing reports. There is need for dialogical conversation as well as instant questioning and responding to students' questions afforded by ETs such as wikis.

Five: Doing history

In 'doing history' students collaboratively interpret and attach meaning to the past by using the wiki as the mediating tool. The educator/teacher provides tasks that enhance learners to make their own interpretations by considering multiple sources; representations, relics from the past like videos and texts, and visiting elders as sources of evidence from which collaborative interpretations about history meanings. As reflected in the preceding section, C21st students participated in doing history through sharing texts, pictures and videos. Doing history might be achieved through active engagement and making sense of images, videos, pictures and texts obtained from the past (Sebbowa & Nabushawo, 2019).

5. Conclusions, Limitations and Future Research

The research was initiated to support history educators/teachers to embrace pedagogical approaches aimed at arousing C21st students' interest, identification and engagement in the study of the past. DBR methodology provided a systematic structure for supporting dialogical conversations between C21st students and educators mediated by ETs. The study revealed that, ETs such as, wikis are useful environments that attract and interest C21st students into active engagement and learning about the past.

The study encountered two major limitations. Firstly, there was a conflict of interest in my roles as a researcher and educator at the same time. This bore a minimal impact on the process of data gathering and the outcome of the research finding as all research activities were recorded and monitored. Secondly, the limited number of participants who engaged in this study may not have been representative of the general status of History Education at Makerere University. Future research should engage more participants with a quantitative focus on in-service teachers in school settings. This could include plans such as conducting iterations and workshops in school settings to explore impact of ET in actual teaching of history at the secondary school level. In terms of theory, it would be interesting to see more studies in the area that ground their findings in social constructionism theoretical perspective.

6. References

- Akker J., & Nieveen, N. (2017). The Role of Teachers in Design Research in Education. In S. Doff & R. Komoss (Eds.), *Making Change Happen*. https://doi.org/10.1007/978-3-658-14979-6_9
- Alghasab, M., Hardman, J., & Handley, Z. (2019). Teacher-student interaction on wiki fostering collaborative learning and writing. *Learning, culture and social interaction*, 21, 10-20. <https://doi.org/10.1016/j.lcsi.2018.12.002>
- Aying, C., Awang, M. M., & Ahmad, A. R. (2019). The Use of Digital Technology as a Medium of Teaching and Learning History Education. In *the 2nd International Conference on Sustainable Development & Multi-Ethnic society*. Red white Press 151-155. <https://doi.org/10.32698/GCS.0188>
- Barbosa, M. S. (2018). The African perspective in the General History of Africa (UNESCO) *Tempo*, 24(3), 400-421. Retrieved from <http://orcid.org/0000-0002-6307-8847>
- Bentrovato, D., & Wassermann, J. (2018). Mediating transitional justice: South Africa's TRC in history textbooks and the implications for peace. *Global Change, Peace & Security*, 30(3), 335-351. <https://doi.org/10.1080/14781158.2018.1438386>
- Brims, M., (2019). Kahoot in the History Classroom: An Exploration of the Value of Gamified Quizzes. Retrieved from <https://eureka.utschools.ca/wp-content/uploads/brims-2019.pdf>
- Fisher, J. R., & Allred, S. D. (2020). Using Crowdsourced Wikis to Teach an Online Undergraduate Course. *Online Learning*, 24(3). <https://doi.org/10.24059/olj.v24i3.2152>
- Gadamer, H. G. (2004). Truth and Method. (J. Weinsheimer & D. Marshall, Eds.) (3rd ed.). London, New York: Continuum International Publishing Group. <https://doi.org/10.2307/1773014>
- Gómez-Carrasco, C. J., Miralles-Martinez, P., Fontal, O., & Ibañez-Etxeberria, A. (2020). Cultural Heritage and Methodological Approaches—An Analysis Through Initial Training of History Teachers (Spain-England). *Sustainability*, 12(3), 933. <https://doi.org/10.3390/su12030933>
- Herrington, J., & Reeves, T. C. (2011). Using design principles to improve pedagogical practice and promote student engagement. In G. Williams, N. Statham, N. Brown, & B. Cleland (Eds.), *Proceedings ascilite 2011*. (pp. 594-601). Retrieved from <http://www.leishman-associates.com.au/ascilite2011>
- Ismail, N. (2020). Wiki moderators' contributions to enhance the pedagogical implementation of Wiki. *Journal of Education Culture and Society*, 4(2), 192-199. <https://doi.org/10.15503/jecs20132.192.199>
- Korhonen, A-M., Ruhalahti, S. M., & Veermans, M. (2018). The online learning process and scaffolding in student teachers' personal learning environments. *Education and Information Technologies*, 24(1), 755-779. <https://doi.org/10.1007/s10639-018-9793-4>
- Kovacic, A., Bubas, G., & Zlatovic, M. (2008). *E-tivities with a Wiki: Innovative teaching of English as a foreign language*. Visions IT, Visions for IT in Higher Education. Retrieved from <https://www.bib.irb.hr/362544?rad=362544>
- Lambert, D. G., & Jacobsen, M. D. (2019). Implementing an Intervention into a Grade Six Learning Environment: A Design-Based Research Framework. *EDeR - Educational Design Research*, 3(1), 1-36. doi.org/10.15460/eder.3.1.1388
- Ministry of Education and Sports (MOES). (2020). Framework for Provision of Continued Learning during the COVID- 19 Lock down in Uganda. Retrieved from <http://www.education.go.ug/covid-19-sector-response/>

- Medero, G. S., & Albaladejo, G. P. (2020). The use of a wiki to boost open and collaborative learning in a Spanish university. *Knowledge Management & E-Learning*, 12(1), 1-17. <https://doi.org/10.34105/j.kmel.2020.12.001>
- Miguel-Revilla, D., Martínez-Ferreira, J. M., & Sánchez-Agustí, M. (2020). Assessing the digital competence of educators in social studies: An analysis in initial teacher training using the TPACK-21 model. *Australasian Journal of Educational Technology*. <https://doi.org/10.14742/ajet.5281>
- Nussey, R. (2018). Difficult relationships: How will compulsory School History and an Ubuntu-based curriculum help nation-building in South Africa?. *Yesterday and Today*, (20), 1-17. <https://doi.org/10.17159/2223-0386/2018/n19a1>
- Papavlasopoulou, S., Giannakos, M. N., & Jaccheri, L. (2019). Exploring children's learning experience in constructionism-based coding activities through design-based research. *Computers in Human Behavior*, 99, 415-427. <https://doi.org/10.1016/j.chb.2019.01.008>
- Pais Marden, M., & Herrington, J. A. (2020). Design principles for integrating authentic activities in an online community of foreign language learners. Retrieved from <https://ro.uow.edu.au/lhapapers/4208>
- Reeves, T. C. (2006). Design research from a technology perspective. *Educational Design Research*, 1(3), 52-66.
- Risser, J. (2015). Dialogue and Conversation. In J. Malpas & H.-H. Gander (Eds.), *The Routledge companion of Hermeneutics* (pp. 335-343). New York: Routledge, Taylor & Francis group. <https://doi.org/10.1002/9781118529812.ch13>
- Ruzmetova, M. (2018). Applying Gilly Salmon's Five Stage Model for Designing Blended Courses. *Dil ve Edebiyat Araştırmaları/ Journal of Language & Literature Studies*, 17(17), 271-290. <https://doi.org/10.30767/diledeara.418085>
- Salmon, G. (2002). *E-tivities: The key to active online learning*. London and New York: Routledge.
- Salmon, G. (2013). *E-tivities: The key to active online learning* (2nd Ed.). London, New York: Routledge. <https://doi.org/10.4324/9780203465424>.
- Salmon, G., Nie, M., & Edirisingha, P. (2010). Developing five-stage model of learning in second life. *Educational Research*, 52(2), 169-182. <https://doi.org/10.1080/00131881.2010.482744>
- Sebbowa, D. K., & Nabushawo, H. M. (2019). Emerging Technology Mediation among Preservice History Teachers at Makerere University. *Makerere Journal of Higher Education*, 11(1), 1-15. <https://doi.org/10.4314/majohe.v11i1.9>
- Sebbowa, D. K., & Muyinda, P. B. (2018). The Utilization of a Mobile Phone Forum on the Winksite application in the teaching and learning of History: a case study of Pre-service Teachers at Makerere University. *Yesterday and Today*, (20), 124-147. <https://doi.org/10.17159/2223-0386/2018/n19a6>
- Samalieva, M (2018). Using wikis to develop writing academic skills among pre-service EFL teachers. *Science & Research*, 11(2). Retrieved from <http://www.sandtr.org/journal/0/50.pdf>
- Sosa, E., Salinas, J., & De Benito, B. (2019). Emerging technologies (ETs) in education: A systematic review of the literature published between 2006 and 2016. *International Journal of Emerging Technologies in Learning*, 12(5), 128-149. <https://doi.org/10.3991/ijet.v12i05.6939>
- Su, F., & Beaumont, C. (2010). Evaluating the use of a Wiki for collaborative learning. *Innovations in Education and Teaching International*, 47(4), 417-431. <https://doi.org/10.1080/14703297.2010.518428>
- Syaripuddin, R., Ahmad, A. R., & Awang, M. M. (2019). The Use of Video in Teaching and Learning 21st Century History Education in Malaysia. In *the 2nd*

- International Conference on Sustainable Development & Multi-ethnic society*, 182-186.
<https://doi.org/10.32698/gcs.0194>
- Veletsianos, G. (2016). The defining characteristics of emerging technologies and emerging practices in digital education. *Emergence and innovation in digital learning: Foundations and applications*, 3-16.
- Villena Taranilla, R., Cózar-Gutiérrez, R., González-Calero, J. A., & López Cirugeda, I. (2019). Strolling through a city of the Roman Empire: an analysis of the potential of virtual reality to teach history in Primary Education. *Interactive Learning Environments*, 1-11. <https://doi.org/10.1080/10494820.2019.1674886>
- Wang, F., & Hannafin, M. (2005). Design Based Research & technology-enhanced learning environments. *Education Technology Research and Development*, 53(4), 5-23. <https://doi.org/10.1007/bf02504682>
- Wright, P. (2015). Comparing E-Tivities, E-moderation and the five-stage model to the community of Inquiry model for online learning Design. *The Online Journal of Distance Education and E-Learning*, 3(2), 1. <https://doi.org/10.3390/educsci4020172>