Reviewer's report

Title: Casebook: A virtual patient iPad application for teaching decision-making through the use of electronic health records

Version: 1 Date: 30 December 2013

Reviewer: Uno Fors

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This is a manuscript concerning an interesting topic – how to develop educational Virtual patient cases with ease. However, the manuscript lacks some details on the Educational potential/ possible learning outcomes of this (limited) type of VP cases; How much easier the case creation process is as compared to other VP systems; and How this new type of VPs really function and if it really should be considered as a VP system at all, or maybe better referred to as medical record visualisation tool?

Major Compulsory Revisions
Page 2 – Abstract
- it is stated that “VPs are unaffordable for most institutions”. This is not in agreement with much of the recent research, which indicates that VPs are implemented in a high number of medical curricula over the world. Please re-phrase or re-formulate this statement.

Page 3 – Abstract
- it is stated that “many VPs systems are produced as one-offs”. Please either support this with references or change the statement, since I believe this is not true for most VP-system implementations in the world today.

Page 4 – Background
it is stated that this new type of VP cases “more closely mimic real-life scenarios than traditional Virtual Patients that rely on produced or simulated data.”. Is this true? According to my knowledge, are most VP cases produced today aimed to visualize real patient cases, or cases that could have been real cases. I cannot see what the difference could be with your cases, since both “traditional” and your cases are aimed to resemble real patient cases. Please re-phrase.

Page 4 – Background - Motivation for the design of Casebook
All of these four statements/observations lack references. Even if you have tried to refer to literature after these initial statements, the reader might believe that these for statements are undisputable facts, which they are not. So please re-write this section.

“Virtual Patients are costly to produce: hence they tend focus on complicated
scenarios”. I do not agree. To my more than 25 years of knowledge of the VP field, are most VP cases created in the world focused on general cases and not complicated scenarios. Please supply good references that support this statement, or delete.

“there are several inherent properties of health records that make them useful teaching materials”. Please explain which properties you mean.

Page 5 – Background – VP production costs
“61% of cases required more than six months’ production time, while the average production time was 16.6 months…”. This reference (Huang) is old and refers to a type of VP systems that are not used so much today. In contrast - there are a number of more recent publications that describe how VP cases can be easily created within hours using Templates, using students to develop cases on their own and/or using the ANSI VP-standard to exchange cases between different case creators/schools/systems.
Please update to newer references or really debate why this old reference is valid here.

Page 6 – Background – Power of the plural
“patients are being dealt with in outpatients’ wards rather than being hospitalised, meaning students have less access to patients exhibiting common conditions [7]”.
There are descriptions on how students also can be active in outpatient clinics, so please re-phrase this statement.

Page 6-7 – Background – Power of the plural
“In fact, a previous review paper by our group has shown that interchangeability is not commonplace in Virtual Patient design”. There has since a number of years been published both an ANSI-standard on VP case interchange format as well as papers describing the positive outcomes of this since it makes it possible to exchange cases not only with a system between schools, but also between a large number of different VP systems. Additional there have been at least one large EU project in this field that proved the easiness to develop hundreds of cases and interchange them freely (the eViP project). Please re-phrase or delete this sentence.

Page 7 – Background – Student preparedness
“As previously mentioned, individual Virtual Patients warrant significant production costs.”
Do not agree, see above.

Page 8 – Background – Health record properties
“This would allow students to examine the cause of an error, or perhaps more importantly, the course of events that occurred which eventually led to an error.”
Please explain and discuss the differences and pros/cons with your system
approach, as compared to more “traditional” VP systems and cases.

Page 10 – Case file format
Please tell which EMR system that your system works with, any standard it is related to etc.

Page 11 – Security…
Please discuss if your system allows the cases to be unidentified/anonymous or not. And if not, why is that not the case?

Page 12 – Security - passwords
Too much emphasis on the passwords etc aspects, than on the educational potential of this system. Please delete some of the details.

Page 13 – Results and Discussions
“As the user navigates through a patient case, they will occasionally encounter multiple-choice questions which they must answer before continuing (Figure 4).”
This is not what a normal VP system is about. Such a system is based on User (inter)activity and clinical reasoning training. Including letting the learner to suggest actions and then revealing the result of that action.
What you describe with these MCQs are normally not seen as fostering clinical reasoning, but that they are more into Assessment of facts and other medical “bits and pieces”.
Please discuss how you MCQ concepts relate to learning outcomes in clinical reasoning

Page 13-14 – Software and functionality
This is one of the major shortcomings of this manuscript. There is very little information on the real functionality of the system, most of the illustrations contain only rubbish/placeholder texts and there is virtually no info on the learning outcomes of this new approach.
There is a clear need to include such info in a paper that says that it is describing a superior approach to medical education that “traditional VP systems”.

Page 14-15 – Results and Discussions – Future development
There is a need to tell more about the educational possibilities with this new system, compare it with other VP systems.

Page 14-15 – Results and Discussions – Future development
“Finally, cases must currently be created manually by collecting the health records required and describing their order, annotations and question data in the case.json descriptor file. However, this procedure is rather time consuming, especially with regard to the manual creation of the case.json descriptor file.”
Here you are contradiction yourself, since the aim of this new system was to facilitate the case creation and reduce time needed.
So, please tell the reader about the time and efforts needed to create your type of VP cases and their functionality, and then compare that to other modern VP systems.

Finally – what I can understand from the video file and all illustrations, is this new system rather a nice pedagogical way to display medical records, annotate them with supplemental texts and MCQs before allowing the learner to go on to the next section where the next piece of record info is displayed. So – in my eyes, this is not a VP-system, which normally allows the student to independently and actively explore a case, perform actions and see the results of those actions.

Minor Essential Revisions
Page 10 – Case file format
“As the case is navigated, the student must answer questions about the progression of the case (“What would you do next” questions)—the next patient record revealing the answer”

Is the real patient record always correct? Meaning - are all medical records always showing up “schoolbook” examples of correct medical behaviour/treatments? Probably not. Please discuss this.

Page 11 – Security…
“remotely wipe devices”… is described twice. Please change

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests