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| Reviewer | Comment Reviewer | Answers/Improvement |
| Reviewer B | *Are title, abstract and keywords appropriate?*Yes, but maybe the title should emphasize that this is a study or a discussion on how to highlight and support learning experience using technology-scaffolded methods | New title to better address the content...Learning Analytics Architecture to scaffold learning experience through technology-based methods |
| Reviewer D | *Is the paper length suited?*The paper is well structured and readable. The paper is too long. | Section 1 and 2 have been shortened, and more evidence to support the approach has been included.  |
| Reviewer B | In the introduction, the authors say the growing number of learners presents a new challenge in terms of a more scalable and sustainable way of monitoring learners performances.   | The challenges are better explained. The added case studies indicate some possibilitiesReferences are added for big data processing which is one of the problems for timely access (requires processing capacity).  |
| Reviewer B | Which is the complexity of this scalability? What is the problem of timely access? Is it due to access and communication times or due to intrinsic complexity? | References are added for big data processing which is one of the problems for timely access (requires processing capacity).Secondly it is also about all the data and the interrelation among different variables which lead to a high complexity |
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| Reviewer D | Authors need to list the main contributions this paper is offering at the end of the “Introduction” section. | Done  |
| Reviewer D | *Does the introduction present the context and the goals of the paper so that the reader is invited to continue reading?:* Not clearly. The introduction does not carry the reader into the ideas and does not prepare the reader on the goals and contributions this paper is providing. I suggest listing the contributions this paper is offering at the end of the Introduction section as well as the conclusions section in order for the reader to grab what sort of novel ideas this paper is presenting. | Done  |
| Reviewer B | *Is advancement over the state of the art significant? Is related work properly reported and compared with the proposed novelty?*: May be the section 2 "Related concepts" should be shortened, revised and improved. Maybe the title should emphasize that this is a study or on disucussion This section should be shortened, revised and improved. Other factors should be deepened or discussed. | This has been shortened, revised and made more concise so that the whole article focuses more on learning analytics and scaffolding methods.  |
| Reviewer D | *Is advancement over the state of the art significant? Is related work* *properly reported and compared with the proposed novelty?*Not clearly shown. | See above. Section 2 is updated with new references showing the advances. |
| Reviewer D | “Related Concepts” is too long. Authors should rewrite this section focusing on important and directly related literature work to this paper. | Related concepts restructured and substantially revised to better address the purpose of the paper…  |
| Reviewer B | Section 2.1 seems less important to the argument. Studies have shown interest in SG for engaging learners in their learning, it is not necessary to dwell on the issue, it is commonly accepted | 2.1 deleted |
| Reviewer B | the beginning of Chapter 2.2 is superficial and there are repetitions with the introduction. | *2.2 is cut and restructured* |
| Reviewer B | The end of Section 2.2 against is really interesting (qualitative analysis to understand conceptions, beliefs and actions of learning instances, suggestions, tailored feedbacks, personalized experiences…). The relevant point should be how to operationalize this in a formal approach | Section 3 outlines the conceptual architecture that will help in operationalising. More details on this approach are delivered and references added.The evidences are presented in section 4.  |
| Reviewer B | In Section 2.3, it is confused when authors speak about cognitive psychology because SG take place in a constructivist approach more than in a cognitive approach.What are the necessary artificial intelligence decisional processes and which knowledge representations? | The section is restructured. Even though SG is mainly based on constructivism, there are elements of cognitive psychology that are of relevance, f.ex for the area of flow and also for personalisation, thus kept. This would require much more detail of the LA software developed. It is not the main scope of the paper, and due to the underlying complexity not addressed in detail, since it will also differ for different games.  |
| Reviewer B | The considerations remain on the level of interest but it is hard to understand what are the difficulties and the locks and how to propose effective solutions.(The conceptual architecture) | Due to the restructuring on a more focused topic, this should now be clear to the reader.  |
| Reviewer B | The introduction of the Section 3 is well argued and interesting. The figures in this section and in the next section do not show a formal approach and do not contribute to a scientific approach. There is a lack of roles models, semantics in data exchange between different boxes, etc. | The section is revised and extended |
| Reviewer B | Some other considerations could be interesting to discuss about how present semantic data to the teachers/trainers | Examples of the visualisation are now given in section 4. Fig. 3 shows the main structure of the information flow.Fig. 4 describes the semantics in the ecosystem  |
| Reviewer B | Which are the meaningful interactions? | That depends on the gameplay and the game purpose. See example 1 section 4.2 |
| Reviewer B | How to select relevant information? | Again, this depends on the purpose, see section 3.2- we use game level and genre-level traces, and have added a discussion on which to use.  |
| Reviewer B | How to personalize this information depending on teachers’ preferences? | Here we give an example with the dashboard. This could f.ex be personalised. |
| Reviewer B | How different data sources are processed, used and merged? | The concept foresees that this could done in the LMS level, when games are integrated within LMS. In addition, we have added a second case study discussing data collected from 9 different Spanish schools.  |
| Reviewer B | How uncertain data are processed? | Through alternative analysis, see case study 2 |
| Reviewer B | What is an optimal learning zone? | This is individual for each learner. The optimal learning zone is determent via predictive model, and success/failure patterns correlated with the collected game data. It is the zone in which the learner has the best possible conditions to learning experience  |
| Reviewer B | Is it closer to the proximal development zone Vygotsky? | The optimal learning zone provides the assistance and feedback based on personal preferences and needs, and can be connected to the proximal development zone as the assessment outcome is used to better players results within the game. |
| Reviewer E | The article presents some input on these considerations and on the interest of such a model based on learning analytics to support personalized learning experiences but the contribution would be stronger if the authors had a more formal model and an evaluation of this model. (3.1) | The formal approach is explained in the added case studies. |
| Reviewer E | However, mapping pedagogical patterns to game mechanics section requires elaboration. (3.3) | Some more details have been added, and also additional references to articles describing this framework in more detail. |
| Reviewer E | What are these elements?  | Added an example of LM\_GM of a simple game scenario |
| Reviewer E | How are they mapped so that they refer to key engagement points?  | The LM-GM has specific mechanism supporting the engagement f.ex realised in Please answer this theo... i am not sure i understand what the reviewer wants... |
| Reviewer E | What is their relation to scaffolding?  | This relation is briefly outlined in the simple scenario given as an example.  |
| Reviewer E | This section is the backbone of the concept and some demonstrations with the use cases developed would help understanding the concept and how it contributes to the advancement of knowledge in the reserach domain. (3.3) | See section 4. 2 with added use cases |
| Reviewer E | The paper present a good exploration and an interesting discussion of theses key considerations as learning analytic platform, user modeling/adaptive control and visual analytics, maps of pedagogical patterns to game mechanics, etc. But the study seems to lack maturity to transform these considerations into more formal proposals and more concrete models. The authors present a conceptual model but they remain on high level and abstract aspects rather than a formal and concrete model. (4.) | Case studies added that show some examples on concrete implementation in an ecosystem. |
| Reviewer B | The work deserves to formalize the model and the process of adaptation / personalization (4.) | This is future work. So far we have addressed formalisation of some elements of the conceptual architecture. |
| Reviewer B | The ecosystem concept deserved to be further. How to exploit learning analytics concretely? Is it considered using existing models traces? (4.) | Showed with case studies.  |
| Reviewer D | This paper introduces a conceptual model (ecosystem and architecture) that can potentially support the scaffolding of teaching and learning experience within a formal setting: How this system compares to others listed by the authors in related work? This does not appear clearly in the paper. (4.) | This has been restuctured to make it clearer, and the examples in the paper compliment the ecosystems concept. They are part of the same ecosystem.  |
| Reviewer E | There is an unnecessary gap on page 9 due to the location of Figure 3. Figure 3 should be more clearly explained within the text referring to its components one by one. | Fixed |
| Reviewer B | Are the results properly presented? Are the conclusions significant?The paper presents a discussion, There is no real results. I think the discussion is interesting but the results or conclusions are not significant enough or not thorough enough discussion to provide more concrete models or even a design methodology.Without a more concrete process and some kind of evaluation, this is premature for a journal paper. | Results added in section 4.2 and references added. |
| Reviewer D | Results are not properly presented. Conclusions section need a re-visit to highlight the contributions of this paper. | Results added, conclusions re written  |
| Reviewer D | Authors need to list in the “Conclusions and future work” section a summary in bullet points on what has been offered by the work presented in this paper. | Done. |
| Reviewer D | This paper includes existing findings and initiatives: Where are these findings listed in the paper, how many case studies are carried, what sort of results and how compared to other related work? | Now covered, we have two case studies. References added to similar works. |
| Reviewer E | What type of empirical studies are planned and with how many participants for which task, etc.?  | Some empirical studies are carried out already. As a part fo the sg living labs activities we plan to carry out at least 4 experiments between 15- 48 partipants each. |
| Reviewer E | In summary, the paper describes the conceptual model, but without use cases and testing, the model doesn't verify the theory. I would strongly recommend to add some snapshots of the system developed so far, as well as proof of testing. | Case studies added.  |