Response from Clements, Atterby et al. to reviewers:

Reviewer 1 – Flavia Strani

Thank you to Flavia for their thorough and thoughtful review. Flavia raises several important comments and suggestions which we have implemented. Below we document our responses to their comments:

Line 18: Remove 'Indeed'.

Done

Line 23: Remove 'moreover'

Done

Line 60: Do you mean other references within Pringle et al. 2017? Please clarify

Fixed by inserting a ;

Line 78: See above comment

Fixed by inserting a ;

Line 101: grammar edit

Fixed as requested

Line 112: grammar edit

Fixed as requested

Line 122: A video game series that features palaeontology-related plot and theme is Syberia (Syberia, 2002, Microïds; Syberia II, 2004, MC2-Microïds; Syberia 3, 2017, Microids). In this graphic adventure videogame the player encounters a tribe which live with domesticated mammoths (possibly Mammuthus primigenius) and also has to visit a fictional university which features mounted skeletons of mammoths. I don't think this series falls within the categories discussed in this section, but I suggest to discuss its possible potential as a communication tool somewhere in the paper.

Thanks very much for bringing this game series to our attention! None of our team has played the Syberia, so it would be difficult to know exactly where the game fits within our paper (we tried to only incorporate games we have played for fairness). However, this comment does highlight that the list of games we cover in the manuscript is not exhaustive, and we should strive to make that as clear as possible. We have amended line 123 to read: In this review, we focus on COTS video games that incorporate fossils and/or ancient animals as one of the playable or interactive aspects of the game. This review does not include games based on human remains or artifacts (archaeology). Due to the vast quantity of palaeo-themed COTS games there are titles that may not be directly discussed herein.

Line 137: perhaps "paleo-themed video games" is a better term

Changed

Line 140: "collectibles" I believe is a more common word among gamers
We didn't even know the difference between collectable and a collectible, so thanks for pointing this out! We have made changes here and throughout the manuscript (4 occurrences).

Line 151: Remove etc.
As the review points out, we don't address all palaeo-games, so keeping this etc. is important.

Line 299: Grammar edit
Changed as requested

Line 302: Grammar edit
Changed as requested

Line 307: remove ice age and replace with Pleistocene mammals
We have kept 'ice age' for our non-specialist readers as it is a commonly used term, however, we have included the term Pleistocene so it now reads: Similarly, *Far Cry: Primal* depicts 'ice age' (Pleistocene) mammals as colossal…

Line 323: *Tyrannosaur* should be in italics
This is incorrect. As the sentence is a heading that is already italicized, Tyrannosaurus *should not be italicized.*

Line 335: A couple of references to paper reviewing or describing the fossil taxa from these locality [sic] should be provided (Morrison/Hells Creek Frm).

Appropriate references have been added.

Line 342: (= Pleistocene, specifically Late Pleistocene). It's important to clarify that these terms are colloquially used when referring to an actual geological epoch

Amended as per line 307.

Line 346: also in the Syberia series, see comment above section 2.

We have included the game as advised.

Line 362: Please add a bit of information about these taxa as many readers may be unfamiliar with them. Specify if they are arthropods, tetrapods etc…

Amended as requested. The sentence now states: Anomalocaris (a stem arthropod), Eusthenopteron (a sarcopterygian fish), Acanthostega (a stem tetrapod) and Myllokunmingia (a stem chordate).

We have also added more detail to other animals named in the paper where appropriate.

Line 426: This is also true for Red Dead Redemption 2, where entire North American biomes and geological features are very realistic (this is true also for Red Dead Redemption, 2010) to the point that this game can be used for educational purposes. See Crowley et al. 2021: https://doi.org/10.1002/pan3.10242

Thank you for introducing us to this paper! We have included it here in the text - but also in the introduction. The text now reads: Enormous effort is taken to accurately capture the surface geology, flora and fauna, and variable ecosystems in open world games such as Red Dead Redemption 2, allowing players to learn tangentially (see Crowley et al. 2021). Other games, such as American Truck Simulator (2016, SCS Software) allow players to take virtual road trips across hyper realistic (albeit scaled down) sections of the United States including many famous North American fossil localities (e.g. Dinosaur National Monument, Colorado, USA).

Line 502: Specify that however it is possible to extract ancient DNA that can help palaeontologists resolve phylogenetics of extinct taxa. Cite relevant literature such (but not limited to):

Perri et al. (2021) https://doi.org/10.1038/s41586-020-03082-x
Pere et al. (2019) https://doi.org/10.1016/j.quascirev.2019.05.005

This is a fair point. We have re-written the section: It is often not made clear to players that, currently, we are not able to extract viable genetic material from fossilised remains to 'resurrect' extinct animals (although fragmentary fossil DNA can be extracted from some more recent fossils and has allowed important scientific advances in identifying these fossils and placing them in the tree of life: see Buckley and Collins, 2011; Orlando et al., 2013; Perri et al. 2021; etc.).

Line 573: In a recent paper, we discuss ethics and palaeontology within geoconservation while also proposing and formally define the concept of palaeontoethics: DeMiguel et al. (2021) https://doi.org/10.1007/s12371-021-00595-3
This paper should be cited in this section as it is relevant to the current ethical contentious regarding the fossil trade.

Added where appropriate.

Figures:
I suggest to add an additional figure featuring how fossil specimens appear in selected video games. For example a screenshot of the Animal Crossing mounted skeletons or of RDR2 fossil bones the player can find in the field. This would be helpful to highlight how videogames can directly or indirectly teach people how fossils are collected and prepared for exhibitions
We have made a new figure (new figure 4) that shows a selection of ingame fossil collectibles. We have also added a complimentary supplemental table which has the ingame descriptions of these fossils.

Reviewer 2 – Elsa Panciroli

We thank Elsa for their thorough and useful comments - especially for the positivity found throughout the review. We very much appreciate it. Below we document our responses to their comments and the implementations made based on their comments:

Line 28: As I comment later, the addition of some metrics (e.g. how many games surveyed) should be included in the abstract.

We do not believe that the number of games available on Steam is relevant in the abstract. However, as mentioned below, we have increased information in the main text on the metrics.

Line 43: Do you want to use the first person? 'We the authors' might be better kept separate from 'we the science communicators', by speaking about sci commers in the third person. Not a criticism, this is just a style comment and keeps it clearer. I suggest 'Those working as palaeontological science communicators should appreciate the size of....'

This is a fair point. We agree that the way the manuscript is currently worded can cause confusion for the reader and should be changed. 'We' (the authors) have amended the manuscript to make it clearer when we are referring to science communicators

Line 66: I couldn't find reference to this in this paper, could you double check that it supports this statement?

We agree, Kerawalla & Crook, 2005, is not relevant a citation here and has been removed.

Line 98: I agree with you, but I wonder if there is evidence to support this? If there is a reference supporting it then I suggest inserting it. If not, it might be better to make it clear that this is what you are suggesting could be the case, e.g. 'could have a huge impact on' and 'could mislead audiences'.

Absolutely. We have changed the sentence as per your suggestion.

Line 107: Might be worth adding something like '(see below for overview)' so that readers know you are intending to qualify this statement later in the paper.

Thanks, we have added the text you suggested.

Line 120: I would like to see a summary in this section of how many games in total you surveyed for this paper, with a pointer to the supplementary for a breakdown of all of them.

See below:

Line 122: Can you add any quantity to this section, just to summarise and reinforce your argument? If you could give a rough idea of the total number of games with palaeontological content, and the approximate number of people who have bought/played them, it will strengthen your statement that a huge number of people are introduced to palaeontological concepts this way, and reinforce the message of this manuscript.

We have expanded this section to incorporate your comments. The text now reads: There is a huge diversity of video games that contain palaeontological content. As of 2021, there are over 270 palaeo-themed COTS games available on Steam, the largest digital video game distribution service (PC games only) (Figure 2). It is important to note that this number does not include games that have been released for games consoles (such as the SNES, PlayStation, Xbox etc.) and so the number of palaeo-themed COTS games is much greater. Many of the games available on Steam are made by small development teams and will not sell in large quantities, however, mainstream titles can often sell large numbers of games. For example, by 2020 *Jurassic World Evolution* (2018, Frontier Developments) has sold over 3 million copies (Kerr, 2020). In this review, we focus on COTS video games that incorporate fossils and/or ancient animals as one of the playable or interactive aspects of the game, however, due to the vast quantity of these games there are titles that may not be directly discussed herein.

Line 135: Is [sic] it worth adding a sentence to clarify the difference between archaeology and palaeontology, and that these are often confused, and that archaeological games will not be discussed in this manuscript? Just a thought for those who may be less aware of the difference, they are commonly thought to be interchangeable.

Good point. We have added the following sentence to the text: In this review, we focus on COTS video games that incorporate fossils and/or ancient animals as one of the playable or interactive aspects of the game. This does not include games based on human remains or artifacts (archaeology).

Line 270: Is there any way to reference this statement/section - for example has there been any kind of cultural study about such touchstones and tropes?

Good suggestion. We have included García-Sánchez et al. 2021 here.

Line 281: Can this [monsterification] be referenced? Again, can this be referenced? Perhaps a paper in which shrink-wrapping versus fleshiness is tested, or of course there is the book All

Yesterdays, and discussions such as https://blogs.scientificamerican.com/tetrapod-zoology/dinosaurs-and-the-anti-shrink-wrapping-revolution/ where the idea of shrink-wrapping is explored.

Monsterifiction is clearly described later in the text and we have alluded to . However, we agree that Conway et al. 2012 is a useful reference to use here and it has been included in the text.

Line 326: The video game industry is part of the entertainment industry. Maybe rephrase, as currently it sounds as though you are suggesting it is separate.

The video game industry is a sub-division within the entertainment industry separate from, for example, the film industry or music industry. Therefore, this sentence does convey the difference we mean.

Line 388: Very specific, but not a well known classification for readers who are not into taxonomy/birds, suggest changing to 'the owl Blathers, the museum curator'

This is a fair comment. We enjoy Blathers the strigiform museum curator, but we do recognise that this is quite an inaccessible term. To compromise we have added the word owl to the text to clarify the word strigiform.

Line 446: I think there might be a decent amount of literature of teaching evolution through gaming, but I'm not certain - maybe worth taking a look to include some? Not vital, just a thought. It could be useful to point out that this is a wider problem and so place your paper in a wider context.

Surprisingly, we struggled to find much literature on this topic (that is not included in the main text) and the section does not actually address the use of video games in a pedagogical setting, but addresses the portrayal of evolution in video games. We have added some extra references where video games have been used as teaching aids where appropriate such as Poli et al 2012.

Line 447: Such an important observation!

Thanks!

Line 452: I think a summarising statement of the ways in which it is skewed would be useful. e.g. 'Other ways in which evolution can be misconstrued are depicting it as linear,

oversimplified, or directional with a goal (usually of humankind).' This signposts the rest of this section.

We agree that this section could be better signposted. We have re-jigged the intro to read: 'Evolution' is a common theme in video games, but while video games are potentially a great way to introduce players to the complex process of evolution, it should be remembered that COTS games must prioritise delivering engaging gameplay far above educational content. It should also be noted that the term 'evolution' is commonly used in video games to encompass a host of different game mechanics that do not accurately represent the biological process, potentially skewing the player's understanding of the phenomenon.

Line 510: Would be good to reference this paragraph, you probably know more of the literature about this that I do! But perhaps starting points could be: Jones, E.D., 2018. Ancient DNA: a history of the science before Jurassic Park. Studies in history and philosophy of biological and biomedical sciences, 68, pp.1-14.

Attwood, A.I., 2021, September. A Perspective on the Educational Psychological Value of Jurassic Park and Similar Films for Bioethics Discussions. In Frontiers in Education (p. 345). Frontiers.

Agreed, we have added a reference here. We feel that the references provided here are not appropriate for this section - but they are really useful in the bioethics section and so we have incorporated them in other areas of the manuscript!

Line 539: This sentence stuck out, the language doesn't match the rest of the paper, maybe too colloquial. Maybe rephrase, or merge with following sentence e.g. 'unlike other traditional media, modern PC and (most) game consoles are connected to the internet...'

Ok! We have made your suggestion and merged the two sentences. They now read: However, unlike other traditional media, PC and (most) game consoles are connected to the internet, meaning game developers (and even fan communities) can issue updates and 'mods' (modifications) that update gameplay, graphics, or visual assets indefinitely after the games are released. Therefore, new fossil discoveries can be incorporated into game updates to keep games scientifically up-to-date.

Line 537: I think I commented earlier about whether to use the first person for sci commers rather than the authors of this paper

Line 540: This section seems a bit sparse. I realise that's because some of what might be in here is in the following section on ethics, but I wonder if you might expand this section a little to include some info about the realisites [sic] of fieldwork (those reading this without experience of fieldwork may not know what you are getting at). You could also at least signpost the ethcs [sic] of commodification and exploitation here before expanding them subsequently.

We have added a sentence segwaying into the ethics of field work as requested.

We have also added to and re-worded part of the text to incorporate the points raised here: Because fossil extraction is so common in video games, it can give the impression to players that fossil extraction is effortless, unmethodical, and skill-less – quite the opposite of the time-consuming, laborious, and often hazardous excavations that are often required to extract fossils.

Video games can also create the incorrect perception that fossils are a common occurrence in all types of rocks and that a destructive approach is required to extract fossil material. This can be problematic as it may not be obvious to amateur fossils hunters that using hammers on rocks at fossiliferous rock faces may cause irreparable damage, be potentially dangerous, and in some areas illegal. Recently, local government organisations have started to introduce ethical rock collection policies (see Scottish Geodiversity Forum 2017) which can be disseminated to the public by science communicators.

Line 571: Really good point!

Thanks!

Line 573: You should briefly mention the best practice in the real world for fossil collection and acquisition. For anyone reading this who is not involved in palaeontology, they may not understand what the problem is with some of these depictions because they don't know how fossils are supposed to be ethically acquired or studied.

Good point. We have expanded the first section to more clearly outline the issue: While finding and collecting fossils is an integral part of the enjoyment of palaeontology and is important scientifically, one of the most contentious ethical issues facing palaeontology is the buying and selling of fossils (Shimada et al. 2014). The commercialisation of fossil material, especially over the internet and in high-profile public auctions (Shimada et al. 2014), directly leads to a myriad of issues including the destruction of fossiliferous sites by illegal fossil hunters (Murphy, 2007), samples being lost to science (Shimada et al. 2014), and in the worst case, the illegal exportation and smuggling of fossil material (e.g., Pérez Ortega, 2021) – and the consequences of this illicit trade e.g. fuelling humanitarian crises, such as in Myanmar (Dunne et al. 2021; Raja et al. 2021). There is increasing awareness of the problems of fossil commercialisation, yet, in virtually every game featuring fossils as collectibles, excess fossils exist purely to be sold for profit.

Line 612: It might be worth mentioning that scientists are often depicted as the 'bad guys' in all types of entertainment. They are often shown as being so obsessed with their science that all other ethical and moral considerations are not important. The depiction of palaeontological science is therefore falling into this tired trope. Some potential refs could be:

https://www.tandfonline.com/doi/abs/10.1080/0263514032000127220?casa_token=Dyqw8tXErPwAAAAA:7DoNMbPWHKJnPQqi6jHtR9ioVSZWAtY3uwBBysrnnIWi2DL7C1NS3PlQoSqyswTyLnaLoQ5NNOs

or

https://journals.sagepub.com/doi/abs/10.1177/0963662503123006?casa_token=FYRMIYtMFBAAAAAA%3AkK2Zh9gtV9ePoGJ1HZMPG_neV82CuZPUq6kHDc1YT4s-zyhDSNenoTeYV8eW7zu5bdrP58-2x7Q&

and I believe there are some specifically looking at these issues in the Jurassic park franchise.

These are great references - thank you! We have added some text to make you well founded point: After the player collects a number of fossils from across the game world to help her with her research, she assembles a biologically impossible chimaera, and reveals herself to have been a terrible scientist all along – the game falling for the classic trope of the unethical genius (see Weingart et al. 2003).

Line 637: Definitely need to ref this statement - you can use refs outlined elsewhere.

Done

Line 659: Really important point.

Thanks for this comment.

Line 664: Question about first person again (see other comments)

Agreed - we have corrected this sentence so it reads: Care should be taken by scientific communicators to not disseminate these damaging tropes if using video games as part of their engagement, and also take further action by actively highlighting and challenging these practises within palaeontology themed media.

Line 666: I think you should suggest some further research, for example into whether video games do in fact influence people's perception of how evolution works or palaeontology and science is carried out. It might also be useful to incorporate this reference, especially in discussion of the use of gaming for education, and for understanding evolution and natural selection specifically: https://www.learntechlib.org/p/148246/

Thanks for this comment - we have re-written a section of the conclusion to take account of this comment which now reads: Many COTS video games contain elements of good science communication — and some games, especially dinosaur simulators, strive for scientific accuracy. Indeed, aspects of many palaeontological themed COTS video games can be used by science communicators to highlight, engage, and educate the public regarding core concepts of palaeontological science.

While we do not think that adding references to the conclusion is necessary, we have incorporated the excellent reference you include here several times through the text, including altering a section of the introduction: Many COTS games impart complex scientific and historical content to their audiences by presenting the topic within fun and engaging game mechanics in a non-scholastic format (see Herrero et al, 2014; Crowley et al. 2021) and can be used as a tool within a wider educational framework (Herrero et al, 2014).

Line 678: I assume you want to use the first person in this way? You might want to consider changing to the third person ('Science communicators should undertake...'). But this is a style choice,

Amended as suggested

Line 680: First person - see other comments

Amended.

Line 838: These are out of order with one another and rest of refs.

Fixed - thanks.

Line 878: Is this format correct? The rest of the refs seem to have a different format.

This is a news article from Science, not a paper, so the reference is in keeping with the format used. I will flag with the editors.

Line 904: Is the formatting correct for this? The date is at the end of the other refs, and the link should be highlighted.

Fixed, thanks.

Line 976: Number before alphabet, so this should come before Jurassic Park Builder I think?

Fixeed. Thanks.

Figures:

Figure 3:

Suggest changing this fron [sic] 'No dinosaurs' to 'Other extinct animals' or similar.

Done

This figure shows that you've got data and metrics, but there is very little quantitative data in the manuscript. I realise some of this is in the supplementary excel file, but I also didn't understand

exactly what I was looking at in the supplementary - what is the score? Apologies, it's probably my ignorance, but if I don't know then perhaps others will also not know. I suggest adding something in the supplementary file to explain these data, particularly what the 'score' refers to.

Thanks for pointing this out - we have removed the score lists from the supplementary data – it was not utilised in the final manuscript. In accordance with your previous comments, we have included more data into the manuscript .

Reviewer 3 - Andrea Villa

Thanks to Andrea for their detailed and in depth comments on our manuscript. Below we address their thoughts and explain our implementations based on their comments:

1) The authors present a classification of the palaeontological videogames, but it seems to me that a clear and straightforward definition of what they consider a "palaeontological videogame" is missing but could be useful prior to list and explain how these videogames can be categorised. Indeed, it emerges from different parts within the text which games are included as "palaeo-vg" and which are not, but stating this clearly with a few sentences defining the term may be of help in avoid any ambiguity (and it could be also seen as a starting point for future developments on the topic made by either the same or other scholars).

In the manuscript we state: In this review, we focus on COTS video games that incorporate fossils and/or ancient animals as one of the playable or interactive aspects of the game.

We have moved this text to the start of the general introduction section and amended this text to be more explicit. It now reads: In this review, we focus on COTS video games that incorporate fossils and/or ancient animals as one of the playable or interactive aspects of the game, which we term 'palaeo-video games'. This review does not include games based on human remains or artifacts (archaeology).

2) The authors explicitly exclude from their classification of palaeontological videogames those games where, in their words, ancient animals and palaeontological objects are incorporated as "set dressing" or as cosmetic/aesthetic content. I would have a different point of view on this, and I would like to present it to the authors. As said before, this is mainly a discussion point, and the authors are free to ignore my suggestions here.

In spite of often not being an interactive part of the experience, environmental features of the levels/worlds in which a game takes place can be pivotal in favouring the immersion of the player. As such, these features can play an important role both in depicting

palaeontological objects, concepts and extinct organisms and in accustom players to palaeontological objects/subjects as part of a real and diverse community in contrast with a narrative of unconventional and exceptional topic/individuals (thus contrasting a classic view of exceptionality that may have problematic effects on the depiction of palaeontology and palaeontologists; if not intentionally fostering it, of course).

Just to make a few examples of what I mean, considering games that are mentioned at some point within the text:

a) the museum sequence in The Last of Us Part II has a strong value in the narrative of the game, being functional to describe the relationship between two of the main characters and their life together previous to the events narrated in the game. The museum itself, and its content and exhibitions, is used as a tool to develop this narration, including interactions with and line of dialogs on dinosaur skeletons and movies. This is of interest when discussing videogames that have something to do with palaeontology under many levels, I think. The sequence includes themes such as representation of fossils, musealization, the relationship between palaeontological exhibitions and the public (in the dystopic context of TLoU, of course), as well as the cultural references that have shaped the representation of extinct animals presented by the developers…

b) whale fossils in Assassin's Creed: Origins, in spite of being completely disconnected from the plot of the game, still represent a chance to highlight Egyptian palaeontological heritage (and to create a discourse on it). Now, criticism may be moved on how the AC team developed the Discovery Tour and palaeontology definitely plays a very minor role in the specific case of this game, but still I think that features like this in a game may be of interest in a discussion of palaeontological themes in videogames.

It is true that, at least in some of the examples mentioned by the authors at p. 4, lines 126-127, palaeontological contents have a very minor "screen time" and so they may not be really useful as educational tools, in particular for streamers that are employing them for long sessions with a need for continuative presence of the main object of interest. However, I would say that it would still be worthy to mention them at least as a specific category within palaeo-vg (intended in a wide sense), in order to acknowledge their existence and to open to possible future investigations about this type of representation of palaeontology within videogames. A similar line of reasoning may apply to skins and other aesthetic-only content, as they are also representing palaeontology (either in a good or bad way) in the medium.

Andrea makes very valid points here, and we do not disagree with any of them! Set dressing and skins could be a paper in their own right, and this is part of the issue. We are restricted to what we can cover in one manuscript. However, we do feel that Andrea's point is valid, so we have amended this section of text to reflect the points raised here. It now reads: While some of these games, such as *The Last Of Us Part II*, do integrate museum levels into the gameplay that allows players to interact with fossils, typically the palaeo-content of many of these games is purely aesthetic and, therefore, would be of limited use to science communicators.

3) There are at least some parts of the text where the authors seem to criticize exaggerated or unrealistic content developed in the context of a fictional (comic, fantasy, sci-fi…) game under the light of inaccuracy towards the real world and subsequent misrepresentation and disinformation. Examples of this may be p. 12, lines 398-402 ("However, issues arise because other fossils items, ranging from the ridiculous (fossilised cow udders) to the bizarre ('perfectly preserved moustaches') are presented as genuine fossil remains. While clearly light-hearted and for comedic effect, the indiscriminate mixing of real and fake fossils is problematic and would not necessarily be discernible for all players.") and p. 15, lines 501-502 ("It is often not made clear to players that, currently, we are not able to 'resurrect' extinct animals, nor can we extract viable genetic material from fossils."). Issues like these are basically inherent when fiction is present in a media, being it a videogame, a movie or a novel. Works in genres such as sci-fi and fantasy are grounded in some discrepancies with our real world (being them the existence of some alien/fantastic organism, the availability of

particular technologies, or else), and the acceptance of this (the so-called suspension of disbelief) is part of the approach the consumer has towards the work.

It is not clear if these are just warnings for science communicators approaching this kind of games (as it may be, given these are one of the main targets of the paper itself) or actual criticism towards the games. However, at least some passages seem to hint (likely unwillingly) at some sort of "responsibility" of the developers as propagators of misinformation because of not specifying the fictional nature of something featured in their game. I would suggest to maybe better clarify the target and scope of some of the criticism presented in the paper (such as the two examples mentioned above).

This paper is primarily directed towards science communicators (although if game developers read it, then that would be great!). We were careful to not attribute any form of direct criticism explicitly towards game developers while writing the manuscript - we are aware (and point out in the manuscript several times) that developers are typically not scientists and that game mechanics are prioritised over robust science (e.g. we state in the text: Here, we highlight harmful tropes (i.e. unethical behaviour, misogyny, racism etc.) to inform science communicators of the perception of palaeontology that is disseminated by COTS videogames. Furthermore, this review may be of interest to COTS game writers, developers, and video game artists who may be unaware that they are propagating damaging tropes pertaining to palaeontological science.

The first example you use clearly states that we acknowledge that including fossil cow udders is for comedy reasons, but players may not be able to discern between fake and real fossils. This is accurate.

However, your point about the cloning section is fair, and we have addressed the text to avoid this issue. It now reads: Because the trope of DNA extraction from fossiliferous material is so prevalent in media, video game players may not be aware that, currently, we are not able to extract viable genetic material from fossilised remains to 'resurrect' extinct animals

Furthermore, we have gone through the sections and addressed them to make sure that there are no areas that proportion "responsibility" of the developers to avoid misinformation and instead, put the onus on science communicators to highlight these problematic areas.

4) The authors correctly highlight, in various part of the manuscript, the conflict between search for accuracy and commercial/entertainment needs game developers are facing when including any kind of palaeontological content within their games (and this of course apply to any other scientific feature). Just as a thought-provoking question (and I know this is the one-million Golden Coins issue), do the authors think a mixed approach towards palaeo-themed games, balancing accuracy-directed development and other needs, is possible and viable for COTS products? Maybe this topic could be briefly explored in the conclusions…

Some games do try to address the balance between accuracy and gameplay and we mention this in the paper (see simulation games). Based on your previous comment, and the aim of the paper towards scicommers, we do not believe it is suitable for us to discuss this directly. However, from the other reviewer comments, we do say: Many COTS video games contain elements of good science communication — and some games, especially dinosaur simulators, strive for scientific accuracy. Indeed, aspects of many palaeontological themed COTS video games can be used by science communicators to highlight, engage, and educate the public regarding core concepts of palaeontological science.

5) While preparing this review I had the chance to read the comments already posted by the other reviewer, Dr. Flavia Strani, on the preprint web-page of this article. I agree with most of her comments and especially on the needed references she mentions, with particular respect to the palaeontoethics paper (DeMiguel et al. 2021).

See comments made in Reviewer 1 section.

In the end, some other minor changes can be found in the attached pdf.

Thanks. They are addressed below:

Line 112: Typo

Amended

Line 122: I am not sure whether genre can be used here: the following list mainly present games featuring palaeontological content that have common characteristics. Sometimes these are indeed related to a particular genre (park sims, for example), but this is mainly

due to the fact that the characteristics used as discriminats for the classification are inherent to that particular genre. In other cases, the categories include very different kind of games, which are lumped together only by a particular use of the palaeo content.

Thus, I would suggest to simply speak about "categories" here.

We agree and have removed the word 'genres' in the title completely.

Line 215: Collectables? Given this was the spelling used in the previous part of the paragraph.

It has been amended as per review 1 comments.

Line 281: Is there a reference for this? Like a paper, or else, where the term is defined.

See comments to reviewer 2.

Line 343: No italics for sp.

Amended

Line 362: Maybe better to use taxa (or even genera) here, rather than groups as the list only includes genera. This is mainly a personal feeling, though, as I would use groups for e.g species complexes, unranked clades, or families... I leave it up to the authors to chose as they prefer, however.

We have already changed this section based on reviewer 1 comments.

Line 492: Typo

Corrected

Line 525: accession > access?

In this context the meaning of accession is to add something to a collection.

Line 564: Cisneros et al. (2022: https://doi.org/10.1098/rsos.210898) may also be another useful reference here.

Agreed. Added.

Line 578: collectables? Simply to be consistent with previous spelling

Amended.

Line 673: No space

Fixed

Figures

Figure 1: Only a minor thing on the 1996 Pokémon release: the first two japanese versions were red and green, with the japanese blue being released only months later (still in 1996, but I think it would be better to either mention all three colours here or just the two "originals").

Fixed.

Figure 2: J is missing from figure.

Fixed. Thanks