ORIGINAL ARTICLE

User Acceptance of 2D Embryology Animation: Early Embryogenesis Made Easy

Chin Hui Yin[1], Faris Hazreen Jaysri[1], Wan Nur Syaziyah Wan Mohamed Zuri[1], Nurul Amelina Nasharuddin[2], Nurul Huda Mohd Nor[3], Azmah Sa'at[3], Rafidah Hod[3,4], Ahmad Iqmer Nashriq Mohd Nazan[5], Siti Fadziyah Mohamad Asri[6], Razif Abas[3]

[1] Second Year Medical Doctor Programme, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[2] Department of Multimedia, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[3] Department of Human Anatomy, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[4] Medical Education Research and Innovation Unit, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[5] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[6] Department of Anatomy and Physiology, Faculty of Medicine, Universiti Sultan Zainal Abidin, 20400 Kuala Terengganu, Terengganu, Malaysia.

ABSTRACT

Introduction: Embryology, the study of embryo and foetal development, is essential in medical education but often lacks consistent instructional resources. Embryology education in medical institutions primarily relies on traditional lectures, presenting inconsistencies in content depth and duration. To address these limitations, multimedia integration, particularly 2D animations, has been introduced to enhance understanding and retention of embryological concepts. This study aimed to assess medical students' perceptions of a 2D embryology animation depicting early embryogenesis through a user acceptance test. **Materials and methods:** A group of 20 Year 2 medical students underwent this assessment, evaluating usability, learnability, memorability, understanding, and motivation via a Likert-scale questionnaire. A descriptive analysis of mean and standard deviation was conducted using SPSS software. **Results:** Results revealed positive perceptions across genders and ethnicities in usability, learnability, memorability, understanding, and motivation, emphasizing the animation's effectiveness in engaging learners. However, disparities emerged among demographic groups, suggesting a need for tailored approaches to optimise digital learning experiences. Limitations included the small sample size and focus on a specific embryonic stage, urging further studies with broader participant pools and diverse educational stages for improved generalizability. **Conclusion:** Our findings underscore the significance of multimedia in medical education and advocate for further refinement of such approaches to foster inclusive and effective learning environments.
Malaysian Journal of Medicine and Health Sciences (2024) 20(4): 266-272. doi:10.47836/mjmhs20.4.33

Keywords: Anatomy, Animation, Embryogenesis, Embryology, Medical students

Corresponding Author:
Razif Abas, PhD
Email: razifabas@gmail.com
Tel : +603-97692479

INTRODUCTION

Most medical institutions deliver embryology education primarily through lectures, lacking consistent laboratory resources and featuring varying durations of formal instruction. The extent and breadth of the content provided also vary significantly. To address the gaps in conventional resources like textbooks and seminars, some institutions have introduced workshops that merge basic scientific concepts with clinical applications to cover embryology topics comprehensively (1). Understanding embryology significantly aids in grasping intricate aspects of anatomy, particularly elucidating the intricate development of veins, neural networks, and the cranial and caudal aspects. Understanding how organs develop, such as the lungs and heart, contributes profoundly to visualising their growth and function (2).

A comprehensive grasp of embryology holds immense importance in addressing congenital malformations and birth defects, affecting millions of newborns globally each year. Pinpointing the underlying causes of these conditions remains a challenging yet essential endeavour. An understanding of normal development is pivotal to comprehending the anomalies in organ formation (3).

Despite a declining emphasis on embryology in medical education, its relevance in comprehending the origins of birth defects and the intricacies of genetics remains paramount (3).

The challenge of visualising embryonic transformations has led to the integration of multimedia into educational strategies (4). The amalgamation of movies, illustrations, and computer-assisted animations significantly aids in enhancing students' comprehension and retention of embryology. Studies have underscored the positive impact of multimedia usage in embryology classes, noting that its effectiveness is further enhanced when combined with suitable teaching aids (4).

The integration of multimedia, particularly animation, has gained increasing attention in medical education, particularly in the field of embryology. Several studies have highlighted the effectiveness of animation in enhancing students' understanding and retention of complex anatomical concepts, including embryonic development (4-6).

For instance, a study evaluating the impact of 3D animation on medical students' comprehension of embryonic development (5). Their findings indicated that students exposed to 3D animations demonstrated significantly higher levels of understanding compared to those relying solely on traditional teaching methods.

Similarly, Narayanan et al. (2018) investigated the use of 2D animations in medical education, specifically focusing on their role in clarifying intricate embryological processes. Their study revealed that students exposed to 2D animations exhibited improved retention of embryological concepts and demonstrated greater engagement in the learning process (7).

In addition to studies on the educational efficacy of animation, there is a growing body of literature examining the usability of animation applications in educational settings. For example, Guler et al. (2022) conducted a usability study evaluating the navigation and user interface design of an interactive anatomy animation tool (8). Their findings highlighted the importance of intuitive design features in enhancing user experience and facilitating learning.

Furthermore, Mansouri and colleagues (2020) explored the usability of a mobile-based embryology animation application among medical students (9). Their study revealed that while students generally found the application useful, certain interface design elements could be improved to enhance usability and user satisfaction.

In summary, previous literature underscores the potential of animation as a powerful educational tool in medical and embryology education. Moreover, studies examining the usability of animation applications provide valuable insights into optimizing design features to enhance user experience and facilitate effective learning. Consequently, our focus was on evaluating medical students' perceptions of a 2D embryology animation depicting the early embryonic period, taught until the third week of development, through a user acceptance test.

MATERIALS AND METHODS

The creation of this 2D animation marks a shift from traditional teaching methods to digital learning approaches. To assess its acceptance, a User Acceptance Test was conducted involving 20 Year 2 medical students, equally split between genders, with each group comprising 4 Malay, 3 Chinese, and 3 Indian students. The selection of the minimum number of respondents for the user acceptance test was based on a previous study, which determined 20 as the appropriate sample size (10). The study employed descriptive analysis exclusively, utilizing SPSS software version 27 to collect and analyse data obtained from respondents. The Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), was used to measure the mean values for strengths and weaknesses across five aspects: usability, learnability, memorability, understanding, and motivation. These aspects were adapted with permission from a previous similar study that utilised the newly-developed simple 2D animation with schoolers (11).

The usability components selected for evaluation include usability, learnability, memorability, understanding, and motivation. Usability assesses how easy and effective the animation application is to use. Learnability measures how quickly users can learn to use the application, especially for first-time users. Memorability evaluates how well users can remember how to use the application after not using it for a while. Understanding assesses users' comprehension of the content presented in the application. Motivation gauges users' engagement and willingness to use the application for learning purposes. These components were chosen to comprehensively assess users' experiences and interactions with the animation application.

This assessment took place online at the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. The digital 2D animation, depicting early embryogenesis in the anatomy syllabus (as illustrated in Figure 1 based on the current curriculum), was simultaneously shown to all participants twice, with a duration of approximately 9 minutes each time. Following this, the students were given a questionnaire comprising five items to gauge their acceptance of the animation.

The animation itself delineates the early stages of human development across three parts: Week 1, Week 2, and Week 3. Each segment highlights essential keywords

Figure 1: The 9-minute embryology animation focuses solely on the early stages of embryogenesis, from the formation of the cleavage in Week 1 to the completion of gastrulation in Week 3.

crucial for comprehension and retention. Additionally, background music was integrated in an effort to enhance interactivity.

RESULTS

The researchers conducted statistical analysis on the quantitative data obtained from the questionnaires to assess the user acceptance test of the digital 2D animation. Descriptive analysis was employed to examine the mean and standard deviation of each item featured in the 2D animation (Figure 2).

In Table I, which categorises usability scores by gender, there's a consistency in usability scores across gender groups. Both males and females scored above 4.00 for

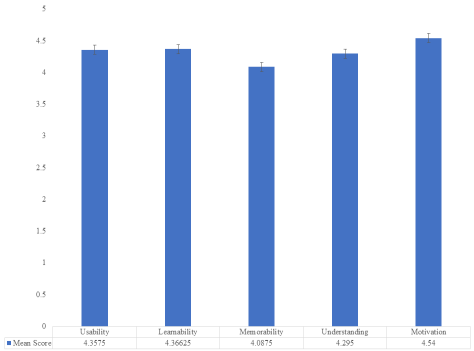

Figure 2: This figure illustrates the mean ratings for five usability attributes: Usability (4.3575), Learnability (4.36625), Memorability (4.0875), Understanding (4.295), and Motivation (4.54).

each item, indicating positive perceptions of usability in the application. Females generally expressed higher comfort levels (evident in Q3) compared to males in using the application for study purposes. Table 1(b) analyses usability scores by race. The usability scores varied among different races for various questions. While Malay and Indian respondents generally rated usability favourably across all questions, the Chinese respondents had lower scores for some items, particularly Question 1 (Q1), where they had the lowest average score of 3.67. Indian respondents scored the highest, reaching a maximum score of 5.00 for Question 2 (Q2), showcasing a stronger understanding of multimedia elements for learning.

Table I: Mean score for usability in application by gender

No	Item Question	Gender	Mean	Std. Deviation
Q1	I could use good interaction skills and active feedback	Male	4.20	0.79
		Female	4.22	0.82
Q2	I understand the layout and the use of multimedia elements such as animation, video and audio better for learning	Male	4.50	0.53
		Female	4.56	0.52
Q3	I am comfortable using this application in the study process	Male	4.00	0.67
		Female	4.78	0.42
Q4	I am clear in understanding of each menu items	Male	4.20	0.63
		Female	4.40	0.53

No	Item Question	Races	Mean	Std. Deviation
Q1	I could use good interaction skills and active feedback	Malay	4.38	0.52
		Chinese	3.67	1.03
		Indian	4.67	0.52
Q2	I understand the layout and the use of multimedia elements such as animation, video and audio better for learning	Malay	4.50	0.53
		Chinese	4.17	0.41
		Indian	5.00	0.00
Q3	I am comfortable using this application in the study process	Malay	4.25	0.46
		Chinese	4.17	0.98
		Indian	4.83	0.41
Q4	I am clear in understanding of each menu items	Malay	4.25	0.46
		Chinese	4.17	0.75
		Indian	4.67	0.52

Table II illustrates the learnability scores across genders, showcasing generally positive perceptions regardless of gender, with an average score exceeding 4.00 for each item. Females reported higher scores across most items, demonstrating a stronger inclination towards learning through the application compared to males. In Table II, examining learnability scores by race, there is variability in scores across different ethnicities. Malay and Indian respondents generally rated learnability positively across all questions. However, Chinese respondents had a lower score, specifically a minimum average score of 3.67 for Question 6 (Q6), indicating a lesser understanding of the storyline compared to other racial groups. Conversely, Indian respondents scored the highest, reaching a maximum score of 5.00 for Question 7 (Q7), indicating a strong correlation between animation and imagining the storyline.

Table III presents memorability scores across genders, indicating that females tend to have slightly higher scores than males, particularly in aspects related to memorising the storyline. However, overall, both genders rated the memorability domain positively, with average scores exceeding 4.00 for each question. In Table III, when exploring memorability scores across races, Malay and Chinese respondents scored below 4.00 for memorising the storyline, whereas Indian respondents reported

Table II: Mean score for learnability in application by gender and races

No	Item Question	Gender	Mean	Std. Deviation
Q5	I am able to learn better through this application	Male	4.10	0.74
		Female	4.89	0.32
Q6	I understand the storyline well	Male	4.10	0.74
		Female	4.22	0.82
Q7	Animation helps in imagining the storyline	Male	4.50	0.53
		Female	4.56	0.52
Q8	I have fun in watching the story in animation method	Male	4.00	0.82
		Female	4.56	0.52

No	Item Question	Races	Mean	Std. Deviation
Q5	I am able to learn better through this application	Malay	4.5	0.53
		Chinese	4.17	0.98
		Indian	4.83	0.41
Q6	I understand the storyline well	Malay	4.25	0.46
		Chinese	3.67	1.03
		Indian	4.67	0.52
Q7	Animation helps in imagining the storyline	Malay	4.50	0.53
		Chinese	4.17	0.41
		Indian	5.00	0.00
Q8	I have fun in watching the story in animation method	Malay	4.25	0.71
		Chinese	4	0.89
		Indian	4.67	0.52

higher scores across both questions. The Malay and Chinese groups particularly struggled with memorisation aspects compared to the Indian group, which displayed a better ability to memorise the storyline and its layout within the story.

Table IV indicates that both genders demonstrated a positive understanding of the application, with average scores exceeding 4.00 for identifying characters in stories and improving thinking skills. The domain of understanding was consistent across males and females, reflecting a strong grasp of the application's content. Table IV reveals that regardless of race, participants reported an average score of 4.00 or above for understanding the application. Malay, Chinese, and Indian respondents each exhibited a solid understanding of the application's content, as evidenced by their positive scores for identifying characters in stories and enhancing thinking skills.

Table V highlights a strong motivation among both genders towards the application, with average scores exceeding 4.00 for preferences towards animation over lecture slides and feeling excited and happy to learn through this method. These findings indicate a high level of motivation regardless of gender, showcasing the application's effectiveness in engaging users. Table V indicates that irrespective of race, participants displayed a motivation score exceeding 4.00 for each item. Malay, Chinese, and Indian respondents reported

Table III: Mean score for memorability in application by gender and races

No	Item Question	Gender	Mean	Std. Deviation
Q9	I am able to memorise the storyline	Male	3.80	0.42
		Female	4.11	0.92
Q10	This app helps me to memorise the storyline layout in the story	Male	4.00	0.47
		Female	4.44	0.71

No	Item Question	Races	Mean	Std. Deviation
Q9	I am able to memorise the storyline	Malay	3.88	0.64
		Chinese	3.83	0.98
		Indian	4.33	0.52
Q10	This app helps me to memorise the storyline layout in the story	Malay	4.13	0.35
		Chinese	4.00	0.89
		Indian	4.67	0.52

Table IV: Mean score for understanding in application by gender and races

No	Item Question	Gender	Mean	Std. Deviation
Q11	I am able to identify the characters in provided stories	Male	4.10	0.57
		Female	4.22	0.82
Q12	I am able to improve thinking skills	Male	4.30	0.48
		Female	4.56	0.52

No	Item Question	Races	Mean	Std. Deviation
Q11	I am able to identify the characters in provided stories	Malay	4.25	0.71
		Chinese	4.00	0.89
		Indian	4.33	0.52
Q12	I am able to improve thinking skills	Malay	4.38	0.52
		Chinese	4.33	0.52
		Indian	4.67	0.52

Table V: Mean score for motivation in application by gender and races

No	Item Question	Gender	Mean	Std. Deviation
Q13	Using animation is better than reading the lecture slides	Male	4.30	0.82
		Female	4.78	0.42
Q14	I am excited and happy to learn with this method	Male	4.30	0.82
		Female	4.78	0.42

No	Item Question	Races	Mean	Std. Deviation
Q13	Using animation is better than reading the lecture slides	Malay	4.38	0.74
		Chinese	4.50	0.84
		Indian	4.83	0.41
Q14	I am excited and happy to learn with this method	Malay	4.25	0.71
		Chinese	4.67	0.82
		Indian	4.83	0.41

strong motivation levels towards the application, expressing preferences for animation over lecture slides and showing enthusiasm and excitement for learning through this method.

DISCUSSION

The assessment of embryology education in medical

schools has revealed a significant reliance on traditional lecture-based instruction, often lacking consistent laboratory resources and featuring varying content depths and durations of formal instruction (12). To fill these gaps, certain institutions have incorporated workshops bridging basic scientific concepts with clinical applications, aiming for comprehensive coverage of embryology topics.

The challenge of visualising embryonic transformations has spurred the integration of multimedia into educational strategies. Our study aimed to evaluate medical students' perceptions of a 2D embryology animation depicting the early embryonic period through a user acceptance test. The animation was designed as a transition from conventional teaching methods to digital learning approaches.

Different racial or ethnic groups may have distinct cultural backgrounds that influence their learning styles, preferences, and perceptions of educational materials (13). Understanding these cultural nuances can help tailor educational interventions to better suit the needs of diverse student populations. Racial or ethnic groups may have varying levels of proficiency in the language of instruction, which can impact their comprehension and engagement with educational materials (14). Assessing racial differences can shed light on the effectiveness of communication. Research also suggests that males and females may have different learning styles and preferences (15). For example, females may prefer more collaborative or interactive learning environments (16), while males may excel in hands-on or visual learning activities (17). Assessing gender differences can help tailor educational materials and teaching strategies to accommodate diverse learning styles.

Our findings regarding user acceptance, evaluated across different demographic groups, shed light on several crucial aspects. In terms of usability, both genders generally perceived the application positively, with females expressing higher comfort levels in its usage for study purposes. Chinese respondents might have different expectations or preferences regarding the usability of educational tools compared to Malay and Indian participants (18). Factors such as interface design, navigation styles, or the overall layout might align more with the preferences of Malay and Indian participants compared to the Chinese group

Learnability, relating to the ease of learning through the application, displayed positive perceptions across genders. Females might have shown a stronger inclination towards learning through the application compared to males due to potential differences in learning preferences. For example, if the application relied heavily on visual learning, females might have been more receptive to this method compared to males who might have preferred other learning modalities (19). Variability was observed among different ethnicities, notably with Chinese respondents displaying a lesser understanding of the storyline compared to other racial groups.

Memorability, reflecting the ability to recall information from the animation, demonstrated positive scores overall. Females tended to have slightly higher scores than males in aspects related to memorising the storyline. The differences observed in memorability scores among demographic groups, specifically with Malay and Chinese respondents showing lower scores compared to the Indian group, could be influenced by various factors. These might include cultural or language-related differences, varying learning preferences, or the familiarity of the respondents with the content presented in the animation (20).

Understanding of the application's content, assessed across genders and races, showcased a strong grasp among participants. Both genders and all racial groups reported positive scores for understanding the application's content, displaying solid comprehension skills (21). Motivation towards the application displayed high levels across genders and races, indicating an overall enthusiasm and preference for learning through the animation method over traditional lecture slides.

These findings underscore the significance of multimedia, particularly 2D animations, in engaging medical students and enhancing their learning experiences in embryology (4). The identified differences among demographic groups call for tailored approaches to ensure inclusivity and effectiveness in digital learning methodologies. Further investigations are warranted to explore and address these differences, potentially refining the integration of multimedia in medical education for improved learning outcomes.

CONCLUSION

In conclusion, the study illuminates the pivotal role of embryology in medical education, revealing widespread reliance on traditional lecture-based teaching methods that often lack consistent resources and exhibit varying content depth. Bridging these gaps, the integration of multimedia, exemplified by a 2D animation in this study, serves as a potent tool to enhance comprehension and retention of complex embryological concepts. While the animation garnered positive perceptions in usability, learnability, memorability, understanding, and motivation across genders and ethnicities, notable disparities surfaced among demographic groups, underscoring the need for tailored approaches to ensure equitable and effective digital learning experiences. Emphasizing the significance of multimedia in engaging medical students, this research advocates for further exploration and refinement of such approaches to foster inclusive and optimally effective medical education

methodologies.

ACKNOWLEDGEMENT

We extend our gratitude to the Anatomy Unit, Department of Human Anatomy, and the Year 2 medical students at Universiti Putra Malaysia for their invaluable cooperation throughout the duration of this study. Their enthusiastic participation and willingness to engage with the study's objectives significantly contributed to the depth and richness of our findings. Their insights and commitment to advancing medical education through this research were pivotal in shaping the study's outcomes. We gratefully acknowledge the pivotal support provided by the grant sponsor GIPP UPM 9323781 and the ethical approval granted under JKEUPM-2021-500.

REFERENCES

1. Khazaei M, Khazaei MR, Mohseni GR, Ansarian A. The Effect of Student Working Group Establishment on Teaching General Embryology Course to Medical Students. Educational Research in Medical Sciences. 2012;1(2).
2. Aversi-Ferreira TA, Aversi-Ferreira R, Nascimento G, Nyamdavaa N, Araujo MF, Ribeiro PP, et al. Teaching embryology using models construction in practical classes. Int J Morphol. 2012;30(1):188-95.
3. Abas R, Masrudin SS, Harun AM, Omar NS. Gastrulation and Body Axes Formation: A Molecular Concept and Its Clinical Correlates. The Malaysian Journal of Medical Sciences: MJMS. 2022;29(6):6. DOI: https://doi.org/10.21315%2Fmjms2022.29.6.2
4. Abas R, Mohamad Asri SF, Saat A, Mohd Nor NH, Hod R, Mohd Nizam DN, et al. A Review of Multimedia Usage in Embryology Education. Asia-Pacific Journal of Information Technology & Multimedia. 2022;11(1).
5. O'Connor C, Jordan K, Vagg T, Murphy CE, Barry DS, Toulouse A, et al. Animated teaching improves student learning of human gastrulation and neurulation. Annals of Anatomy-Anatomischer Anzeiger. 2023;247:152057. DOI: https://doi.org/10.1016/j.aanat.2023.152057
6. Hadie SNH, Dasiman R, Omar NS, Abas R. Effectiveness of Multimedia Approaches in Embryology Teaching: A Scoping Review. Malaysian Journal of Medicine and Health Sciences. 2024;20(1):281-92. DOI: 10.47836/mjmhs.20.1.36
7. Narayanan S, Ananthy V. The influence of learning style in understanding analogies and 2D animations in embryology course. Anatomy & cell biology. 2018;51(4):260. DOI: https://doi.org/10.5115/acb.2018.51.4.260
8. Güler O, Savaş S. Stereoscopic 3D teaching material usability analysis for interactive boards. Computer animation and virtual worlds. 2022;33(2):e2041. DOI: https://doi.org/10.1002/cav.2041
9. Mansouri M, Bigdeli S, Dehnad A, Sohrabi Z, Alizadeh S, Keshavarzi MH. Exploring the Features of Mobile Application of Anatomy in Basic Medical Sciences: a qualitative study. 2020. DOI: https://doi.org/10.1186/s12909-020-02145-x
10. Alroobaea R, Mayhew PJ, editors. How many participants are really enough for usability studies? 2014 Science and Information Conference; 2014: IEEE. DOI: https://doi.org/10.1109/SAI.2014.6918171
11. Ahmad AMb, Aziz MaBM, Abdullah WMB, Shahrudin MSB, Ahmad AB, Dalee M-E. User acceptance of digital 2D animation for educational visualization application: Bintang hati novel. Journal of Computational and Theoretical Nanoscience. 2020;17(2-3):1177-82. DOI: https://doi.org/10.1166/jctn.2020.8785
12. Shankar N, Roopa R. Evaluation of a modified team based learning method for teaching general embryology to 1 st year medical graduate students. Indian journal of medical sciences. 2009;63(1):4-12.
13. La Salle-Finley T, Neves-McCain JR, Li MG, Coleman MS. Examining ethnic identity, school climate, and academic futility among minoritized students. Journal of School Psychology. 2024;104:101285. DOI: https://doi.org/10.1016/j.jsp.2024.101285
14. Von Esch KS, Motha S, Kubota R. Race and language teaching. Language Teaching. 2020;53(4):391-421. DOI: https://doi.org/10.1017/S0261444820000269
15. Dantas LA, Cunha A. An integrative debate on learning styles and the learning process. Social Sciences & Humanities Open. 2020;2(1):100017. DOI: https://doi.org/10.1016/j.ssaho.2020.100017
16. Almusharraf N. Incorporation of a game-based approach into the EFL online classrooms: students' perceptions. Interactive Learning Environments. 2023;31(7):4440-53. DOI: https://doi.org/10.1080/10494820.2021.1969953
17. Stevens-Smith DA. Brain-based teaching: Differentiation in teaching, learning, and motor skills. Journal of Physical Education, Recreation & Dance. 2020;91(7):34-42. DOI: https://doi.org/10.21315%2Fmjms2022.29.6.2
18. Satar S, Morshidi A. An Evaluation of Cultural Roles and Usability Attributes in Learning Management System. Faculty of Information Technology and Multimedia Communication, Open University Malaysia. 2007.
19. Dunlosky J, Rawson KA, Marsh EJ, Nathan MJ, Willingham DT. Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. Psychological Science in the Public

interest. 2013;14(1):4-58. DOI: https://doi.org/10.1177/1529100612453266
20. Salonova A. The role of intercultural communicative competence in the animation sector: multi-stakeholders perspectives: Itᐃ-Suomen yliopisto; 2019.
21. Wahyuningsih D, editor A Whiteboard Animation Multimedia to Improve Teachers' Ability in Understanding Classroom Action Research. International Conference on Educational Research and Innovation (ICERI 2019); 2020: Atlantis Press. DOI: https://doi.org/10.2991/assehr.k.200204.041