

E-VITA methodology and pedagogical concept

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Education and Culture DG

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1 Introduction to the e-VITA Project Methodology

1.1 Executive Summary

This document summarises the methodology to be used within the e-VITA project. It covers the approaches to handling both user groups and communities of practice, and provides a high-level starting point for the design processes within the project.

One of the most significant topics introduced in this document is the use of a four-dimensional framework (4DF) for Serious Game design, which has been developed by the applied research group at the Serious Games Institute. This framework has been successfully applied in the development of past successful projects such as TruSims' "Triage Trainer"¹. It emphasises the four dimensions of context, learner, pedagogy, and representation, and this document relates these dimensions to their likely context within the e-VITA project. By doing so, it stresses the importance of clear and early identification of factors that will impact game design, such as the age and background of the target user group and localisation, and proposes a pedagogical model to underpin the design process.

The diagram included in the final section reflects the outcome of discussions amongst consortium partners, who have agreed that an iterative approach to design (as defined by the 4DF) will yield the most effective solution. It relates the work packages of the e-VITA project to the proposed methodology, and thus produces a preliminary time plan. Whilst this is not intended to represent a finalised schedule for the project, it provides a high level outline for future refinement.

¹ Triage Trainer official website: <http://www.trusim.com/?page=CaseStudy>

2 Introduction

Developing an effective Serious Game represents a significant challenge to both designers and software developers. On the one hand, the need to engage and motivate learners to promote the usage and uptake of the game is essential. However, equally important is the need to ensure the game provides an effective learning experience. In the context of the e-VITA project, this learning experience is defined as the recognition and appreciation of European cultures, which itself is a broad and ambitious goal.

To achieve a Serious Game capable of engaging learners on this level, whilst simultaneously increasing their European cultural awareness, requires a careful balance between creating an immersive and entertaining experience, and providing historically accurate and culturally relevant content. To enable this, a methodology is proposed that seeks to consider the project along multiple dimensions, and promote early and in-depth interaction with target user groups. Section 2 introduces the four-dimensional framework and its associated methodologies in the context of the e-VITA project. Most significantly this section introduces the proposed pedagogy behind the game design, and stresses the need to clearly identify the background and nature of the primary target user group.

In Section 3, the issues arising from the application of the 4DF are defined in terms of consortium activities. This section gives particular attention to the interaction with both communities of practices and user groups, and the need to relate data collection methods and focus group activities to methodological requirements. Furthermore, in order to utilise the outcomes of focus groups and analysed user interactions, an iterative design process is necessitated and the reasoning and suggested deployment for this process is established.

The final section relates the methodology to the project time plan and workflow. It does so diagrammatically, in a form open to input from other consortium partners in order to facilitate their individual input, such as reflections on technological constraints and development times. It should be noted that as a single partner institution, the SGI cannot prescribe a consortium-wide time plan and associated workflow independently, although this diagram may provide a general outline of the timescale of various development iterations.

3 A four-dimensional framework for e-VITA

The dimensions of the 4DF [2], [3] can be summarised in a generic form as follows:

Context must be appreciated, in terms of the available access to supporting resources and learning aids, and situations in which the game will be used. It is important to clarify what, if any, additional support or learning activities will accompany the game, and subsequently refine the game design to reflect this. As a trivial example, the availability of a printed or online manual may mean less guidance on the user interface is required 'in-game', but on a deeper level the availability (or unavailability) of learning professionals in a support context can have significant impact on the game design.

Pedagogy is naturally a highly important consideration in the development of any educational environment.

Learners must be identified at an early stage. Although it may be possible for learners outside the original target demographic to benefit from the game, it is crucial to target a clear user group initially to create an effective Serious Game to at least one demographic. Failure to do so can lead to a game that has too broad a scope, and consequently fails to deliver content effectively to any user group.

Representation is the final key dimension, which considers the availability of technology and the medium through which the game is created. Establishing the technological feasibility of various platforms is naturally the responsibility of technical partners (e.g. Imaginary), although this Section makes some broad assumptions about the platforms likely to be used and discusses associated implications.

This section goes on to consider these four dimensions as they relate to the e-VITA project. Subsequently, a methodology is defined which effectively incorporates these dimensions and hence fully considers the issues that must be addressed in order to create an effective Serious Game. The major components of this methodology as they relate to partners are considered in the next section.

3.1 Context

Initial specification of the e-VITA project suggests a web-based deployment of the final game (either as a downloadable or web-based game). This places immediate and clear contextual restraints, since a web-based user is likely to be playing the game alone or in a small group of users. De Freitas [1] argues that learning is an inherently social process, and as such an effective game must facilitate this form of interaction. Consequently, since e-VITA aims to create a 'single-player' experience as opposed to a game involving interaction between players, it will be necessary for the game to create a social learning environment through the definition of for a where learners or groups or learners share experiences and support, offering opportunities for reflection and interaction with other real-world users.

The European nature of the e-VITA project presents a number of additional constraints. Although the context of a web-based user varies little between member states, some thought

should be afforded to the support available for users wishing to expand their knowledge of European culture and identity, particularly since the game will be seen as a motivational tool to encourage this form of learning. A logical step in this respect would be the addition of further web links to related material. The format of these resources is worthy of consideration, since it may provide a means to create a bridge between users and communities of practice in order to encourage positive interaction between younger and older generations, identified as a key target outcome of the project. However, the language barrier must also be reflected upon; if the game is intended to be localised in various countries, this is likely not to be the case for the majority of additional web resources. Consequently an incongruity may emerge between the game and the differing web resources in their various languages.

In summary, the major contextual concerns revolve around the additional materials and facilitation of learning 'beyond the game' for users. This should be reflected in the game design through enabling and directing the user to additional content. Methodologically, this impacts the consideration of the game as part of an overall aim to encourage and guide reflection on European citizenship, rather than an individual and isolated project.

3.2 Pedagogy

A Vygotskian approach has been taken as the pedagogical underpinning of e-VITA. This approach is useful for e-VITA since it is strongly rooted in a social understanding of the learning process. Given the intrinsically social nature of Vygotsky's pedagogy and the emphasis on social tools – chiefly language – e-VITA will be endowed with mechanisms to ensure the player/learner benefits from the game experience. The rest of this section describes Vygotsky's socio-cultural development theory and presents Stemmel and Fu's responsive teaching as the pedagogy selected to underpin the development of e-VITA.

Socio-cultural development theory, proposed by Lev Semyonovich Vygotsky (1896-1934), was formulated within the context of Marxism in Russia during and after the Soviet revolution of the early 20th century. Vygotsky [5] stated that what differentiates humans from other species is our capacity to work cooperatively arguing biological existence became historical when humans started working cooperatively. Language (understood as a set of symbolisms) became the tool through which cooperative work was done.

In educational processes, Vygotsky argued that the development of higher cognitive processes (attention, logical memory and the formation of concepts) must be found in social interactions rather than in the internal world of the intellect. Since learning is a social produce, it follows learning must provide opportunities for shared understanding through the use of common language to mediate the communication of ideas and achieve the internalization² of concepts [6].

Internalisation is achieved in learner's brain in the interaction between external (social interactions with a more able partner) and the internal (such as memory) activity. The

² Acquisition of knowledge; in a Vygotskian context this knowledge is directly related to the child's culture.

process is supported by external (such as pencils) and internal tools (such as inner speech³) that can be consciously directed by both the learner and the more-able partner to change the object of the interaction or the learning process to suit the learner's needs. It is important to remark that learning is not built simply by copying or transferring from external observations but that they are built through social interaction facilitating the internalization of what is being learnt.

Comparing Vygotsky's to other pedagogies such as Piaget's and Montessori's might help the understanding of socio cultural development theory. Both Piaget and Vygotsky conceived a distinction between spontaneous and non-spontaneous (scientific) concepts being developed by children. They agree children lack awareness of their own mental functions and of their development. Both considered learning as secondary to development: spontaneous and non-spontaneous (scientific) concepts are necessary predecessors of learning. However, Piaget and Vygotsky disagreed in that:

For Piaget, development can actually happen from active construction (better when some sort of activity is involved) and relies upon four factors: motivation, physical experience, social interaction and equilibration. Children build experiences into already existing structures through assimilation. For Vygotsky, development happens during social interactions between the child and a more-able partner. It actually results through challenging the child's intellectuality by means of concepts slightly beyond her current ability. Piaget suggested that non-spontaneous concepts reflect assimilation from adults' thoughts. Vygotsky, on the other hand, thinks that non-spontaneous concepts result from "strenuous mental activity" on the part of the child. For both Piaget and Vygotsky, non-spontaneous concepts are identified as scientific or being out of the child's immediate experiences.

For Vygotsky, development or learning occurs in what he called the "Zone of Proximal Development" (ZPD) which he defined as the difference between the child's actual achievement and his potential achieved with assistance. Social interactions with a more-able partner should result in the ZPD's extension. According to both Vygotsky and Piaget, non-spontaneous (scientific) concepts precede spontaneous ones (related to everyday activities) so the learner will, even though he or she is not aware of any of these concepts, with time, relate spontaneous to clarify non-spontaneous ones. The role of the more able partner is to cooperate by providing conscious and provisional control over the dialogue between the instructor and the learner.

Vygotsky and Montessori [7] also share some similarities and disagreements. Both recognized the importance of the environment but they disagreed on how a learning environment needs to be implemented:

Montessori thought special learning environments had to be manufactured for the child to learn. Vygotsky sees the learning environment as all that involves the socio-cultural background of the social interaction. Montessori sees development as occurring by the accumulation of material in the learner's mind. Vygotsky envisages a strenuous mental activity which leads to the formation of higher functions. For Montessori, the instructor guides the learner presenting attractive environments. The instructor needs to be prepared to give

³ Vygotsky proposed inner speech as a process that involves the transformation of words into thought and described it as "thinking in pure meanings" (Vygotsky, 1934/1987, pp. 280).

students fresh material when they are ready to go ahead. For Vygotsky, the instructor is a more-able partner who is in charge of challenging the learner with activities that go slightly beyond their potential but always within the child's ZPD and providing the right amount and quality of help, scaffolding.

Vygotsky's social interaction approach also highlighted language as a medium for development, in contrast with Piaget's focus on interaction with physical reality and the manipulation of objects. For Vygotsky internalisation was reflected by regularities in the students' behaviours and actions resulting of "strenuous mental activity" propitiated by the more-able partner. The role of the more-able partner is to systematically provide the learner with opportunities to understand non-spontaneous concepts. Students eventually create explanations of the world from non-spontaneous concepts to spontaneous ones using the help provided by the more able partner and in collaboration with him/her.

A pragmatic user of Vygotsky's ideas as pedagogy are found in "responsive teaching" by Stemmel and Fu [8]. The idea behind responsive teaching is to facilitate through social interactions a shared construction of knowledge [8]. It has three key elements:

- Teaching is dynamic and interpersonal (emphasizing the mediation of children's experiences through language).
- Internalization of new concepts is developed through collaborative activity. Mutually constructed activity settings are vital in maximizing dynamic teaching opportunities.

In this approach, the use of resources as means to collaboratively build teaching-learning activities in the context of learner-tutor interaction or peers interactions becomes a central point [8]. The difference with other learning theories is that responsive teaching emphasizes how the more able partner engages students and the degree of control available in pursuing their own interests and activities. The emphasis of responsive teaching is in the creative, shared construction of teaching techniques between teachers and students [8]. Students construct their own knowledge through self-directed activities involving peers, adults and materials. The tutor becomes an observer and a facilitator more than a more-able partner and does not teach specific skills but rather assists children in learning how to solve problems and complete tasks. By doing this in a social context, the tutor helps the student to internalise and reconstruct processes first learned in the course of collaboration (non-specific concepts) while solving a new activity. The use of teaching techniques is not fixed but decided in the process.

Teaching should be creative due to the fact that the relationship between the learner and the tutor must be developed by constructing interactions which create spaces for learning [8]. The role of culture and spaces in the interaction is important as is the relationship of the student with the tools available. In responsive teaching, cooperation with other learners is a way of developing the students' learning by discussing their own subjective understanding. In order to be completely consistent with the ZPD theory, tutors must forget about their own development and concentrate in assisting the learner. Responsive teaching can be described as the mutual work done by the student and teacher for the construction of knowledge. These techniques should involve tools, learning environments and interactions with the tutor and other learners.

Teachers provide assistance to students in activities they cannot do alone and that are interesting to the students. The teacher uses questions, comments, reminders, prompts and other verbal strategies which eventually become self-generated. Stemmel and Fu [8] also warn about questioning which is unnatural, poorly timed or not meaningful and so might not be useful out of context. In responsive teaching, teachers must perceive when children do not understand, or do not have enough time to answer questions. Teachers must allow children to ask questions, as it is through this process (and giving right and wrong answers to questions) that the state of the ZPD in the student is revealed.

3.3 Learners

The Learner dimension of the 4DF is particularly relevant to e-VITA., since the target learners will be drawn from different cultures and member states. Through discussion with partners an age range of 14-20 has been tentatively agreed upon. It is thus stressed that although the end game may appeal to a much wider age range, it is important to design the game with this age group in mind.

This dimension may be broken down into three sub-sections. These include the profile of the target users (in particular the differences between various sub-groups), their role within the learning process, and their competencies.

The Target Audience Profile is, as mentioned, the 14-20 age group, and this is reflected in the pedagogy in the previous section. As European citizens they will be broadly familiar with the notion of European citizenship, but it may be assumed they are unlikely to have considered the concept in-depth. A substantial volume of research exists on individual perceptions of National and European identity, which varies considerably between member states. Although disseminating this broad field of research is beyond the scope of this document, a 2002 EU-funded survey by Edye [4] found that:

46.7% of UK residents aged 18-25 in a major city (London) said they feel 'European' compared to 70% in France. In general the UK is behind many other member states in terms of European integration, and encouraging recognition of European citizenship in this group is a particular challenge, and identifying differences in perception of identity in target countries is also likely to be necessary to create an effective Serious Game.

The recognition of European citizenship was typically on a practical level (e.g. the ability to move and work freely within Europe), and accompanied with little if any understanding of the process by which it came about. This emphasises the need for the overall goals the e-VITA project is aimed at achieving.

Individual consortium members may be able to contribute a further understanding of the profile of users. Reflecting on this profile during the design phases will form an integral part of the design process.

A defined role for users of the Serious Games is also important. The nature of a Serious Game automatically promotes an active role for the learner, and since the game will be deployed via the Internet, it can be assumed they are motivated to learn about European identity before playing the game, although to achieve its larger, long term objective, e-VITA should seek to promote the game to a larger demographic of users without an expressed interest in learning more regarding their European citizenship.

Competencies of this target audience are reasonably assumed as having a basic understanding of standard human computer interaction paradigms, given the significant volume of existing research relating age groups to familiarity and use of information and communication technology. The amount of support the game is required to give to users will be dependant on the sophistication of the user interface, and the game engine (navigating a 3D world using an avatar typically requires more support and guidance than a flash-based approach).

Relating these ideas back to the underlying methodology of the e-VITA project, it will be important to include the target users very early on in the design process, since there are many potential influencing factors such as country of origin, gender, and age (within the specified range). In order to make full use of this early inclusion of learners within the design process, it is necessary to adopt the iterative approach defined in the next section.

3.4 Representation

With the choice of technologies and gaming platform yet to be confirmed, it is difficult to infer the methodological implications in terms of representation at this stage. However, for future reference, this section refers to the likely considerations that will have to be made regarding the design of the game. Again, these may be defined as falling into three areas.

- Immersion. On a high level, it can be assumed a typical keyboard/mouse/monitor configuration will be available to all users. This limits immersion compared to more sophisticated display and interaction hardware, but is a necessary and reasonable assumption for large-scale Internet deployment of the game.
- Fidelity. This relates to the ability of technology to accurately convey design concepts. Technological development requires an inherent compromise between the ideal solution, and that which is practically attainable.
- Interactivity. The depth of interactivity has direct implications for the level of user immersion in the game, and the subsequent ability of the game to evoke changes in affect. However, interactivity is also implicitly linked to non-linearity – the more a user is able to deviate from the established plot lines and storyboards, the greater their sense of interacting with the world in a realistic fashion becomes. Again, game design must inevitably strike a quasi-linear balance, between providing a sense of freedom to interact with the game world, whilst also enforcing deliberate plot outcomes.

Overall, the most significant impact of the representation is on the level of immersion the user experiences, and the subsequent degree of potential the game has to induce affective responses in users. Relating this to e-VITA, it can be seen as advantageous to induce a degree of immersion such that users interact with virtual characters and scenes in a form analogous to real-world interaction. Technical limitations will of course play a part in defining the final design of the games developed, yet to achieve the defined goal of increasing the sense of European citizenship in users it is important to establish a sufficient level of immersion such that users relate in-game learning to the real world effectively.

4 Relating the 4DF to consortium activities

4.1 Iterative Development

In order to accommodate the notions described in the previous section, iterative design is essential. This is a consequence of the difficulty in accurately predicting how users will respond to various designs given the variation in learners and contexts. Figure 1 provides a high-level illustration of this iterative process.

An important aspect of this iterative process is the careful design and conduct of the focus groups so as to obtain meaningful and relevant feedback into the next phase of game design. This optimises the efficiency of the process, since conducting effective focus group avoids wasted technical development time creating game content and features that are later shown to be inappropriate or ineffective to the target users.



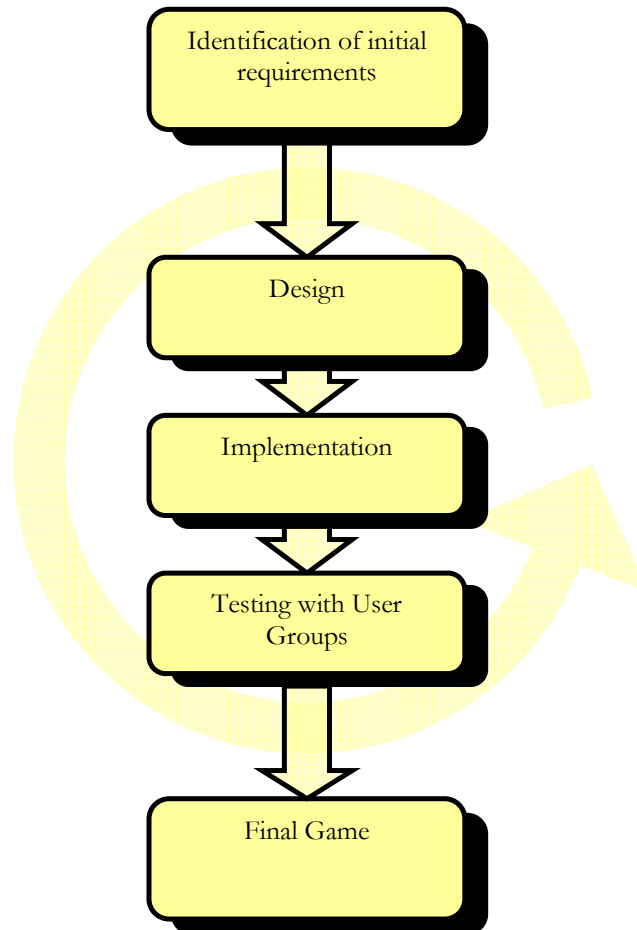


Figure 1: Proposed iterative development approach for e-VITA

4.2 Data Collection and Storyboarding

One of the most challenging aspects of gaining information from the communities of practice (CoPs) is the conversion of linear stories to quasi- or non-linear game content. A structured and consortium-wide process for collecting data from CoPs is advocated in order to ensure all the data required for game design. This will likely involve including a structured question format for interviewers which places an emphasis on:

'What if' scenarios. In many cases, CoPs may be able to provide input on what they imagine would have been alternate scenario outcomes, had they behaved differently. These scenarios need to provide a game which is capable of branching from the linearity of the initial story and hence providing a more dynamic experience. In the interests of historical accuracy, it is important these scenarios are provided by the CoP and not based on assumptions by game designers.

Depth of content. Creating a game requires that visual and auditory elements be created in line with the story. These may not be immediately conveyed by the storyteller, who will typically focus on narrative (rather than dialogic and descriptive) elements if they are conveying the story verbally. Hence it is likely the researcher will need to gather this information through structured questions.

Integration. The many stories gathered will be assimilated into a single (or small number) of Serious Games. To provide a single narrative for this game, it is important that thought is given to the way in which stories may be integrated without requiring compromises with regards to accuracy or meaning. Establishing a small set of clear early themes and storyboards, and encouraging CoPs to contribute stories which would fit within them, should prove beneficial when ensuring as much content as possible can be used within the game.

It is strongly suggested the consortium reflects upon these data collection methods at an early stage, in order to make the best possible use of contact time with CoPs.

4.3 Focus Groups and Evolving Requirements

The focus groups form a fundamental part of the design process. Similar to the interaction with communities of practice, it is strongly recommended that consortium-wide guidelines are developed and used for the testing of the prototype games.

An emphasis will be placed on qualitative feedback. The size of the focus groups must naturally be large enough to reach generalisable conclusions, but it is also advantageous to ensure groups are small enough to ensure all individuals contribute. Groups should be queried on the following areas as a minimum, although additional consortium input will be used to refine the questions posed to groups, as will reflection on the success of previous focus group activities.

Usability, including the effectiveness and intuitiveness of the game interface, and the overall experience with the game itself.

Localisation issues, primarily including any differences in learning outcomes with users from different member states.

Gameplay issues, such as how enjoyable users found the experience and how likely they are to replay the game in the future, as well as the balance in difficulty of the game.

Learning outcomes, which should be given as much emphasis as feedback on gameplay, since the ultimate aim of a Serious Game is to educate as well as entertain. This will represent one of the more significant challenges in this area, since the learning outcomes are focussed upon motivating users to develop their cultural awareness, and as such may not be easily inferred through direct questioning or examination.

General guidelines for conducting focus groups should be referred to in order to ensure best practice. Of particular noteworthiness is the aforementioned fact that substantial differences are likely to exist between users in different member states, and hence the groups must be conducted, and their output interpreted, with this fact in mind.

Following on from the focus group activities, the output of the groups must be accurately transcribed into proposed changes to game design. Particularly with respect to localisation, this will likely mean branching game development into multiple games to meet specific localised user needs. Thought should be given in the early phases of game design to how this branching may be achieved, with a focus on ensuring the assets requiring the most development time (e.g. visual elements such as animation) are constant across versions.

4.4 Potential game design



Figure 2: Screenshot from "Broken Sword" [5], an example of a 'point and click' adventure game with a European setting

This final subsection suggests a loose game design outline based around a methodology derived from the 4DF. It is not by any means intended to provide a final outline for the game developed by e-VITA, rather to draw in the concepts discussed previously and provide a link between the theory of the 4DF and practical game design.

A repeated theme in the preliminary stories collected from the communities of practice is humour, and, indeed, much existing research suggests humour is an effective tool for teaching. Capitalising on this opportunity to explore humour as an avenue for creating an engaging yet also educational Serious Game offers one potential direction for e-VITA game design.

An established entertainment gaming genre which uses situational and dialogic humour as a primary mechanism for engaging and entertaining the user is that of the 'point and click' adventure game. In this genre, the user typically controls their character from a 3rd person perspective by clicking the mouse pointer within a scene similar to that shown in Figure 2. Depending on the location and context of the mouse pointer, the character either moves or interacts with content in the scene (which may include items or other characters).

Interaction between characters is typically handled through branching multiple choice dialogs. Emphasis is usually placed upon the player progressing through solving logical puzzles through methods involving character interaction and object combination.

This would, on initial inspection, appear to provide an obvious and established game model for storytelling, which provides user interaction through puzzle solving and dialogue with characters within the game world. It also fits well within technological constraints, with a basic gameplay model being relatively simple to create, yet substantial scope also existing for integrating high quality animated and artistic content.

Relating this model to e-VITA using the methodology proposed provides a practical example of one possible approach to the overall design and implementation of the game. The key difference between e-VITA's target outcomes and those of traditional point and click adventures is the integration of a deliberate learning model and pedagogy intended to achieve clear learning outcomes. Additionally, the storyboarding draws on real-life experiences from senior citizens, and will be based in historical accuracy.

The initial design for a game based around this model is ultimately driven by the choice of pedagogy. Using a Vygotskian pedagogical model this would, for example, mean the inclusion of a 'learning partner' as a virtual character with which the user may turn to for guidance. The character of this partner could be derived from the CoPs, potentially being a virtual representation of a CoP member. Storyboarding would require that an overarching scenario capable of including a variety of themed subplots based around CoP input could be integrated. Figure 3 shows an overview of the previously outlined methodology in this example of a practical context:

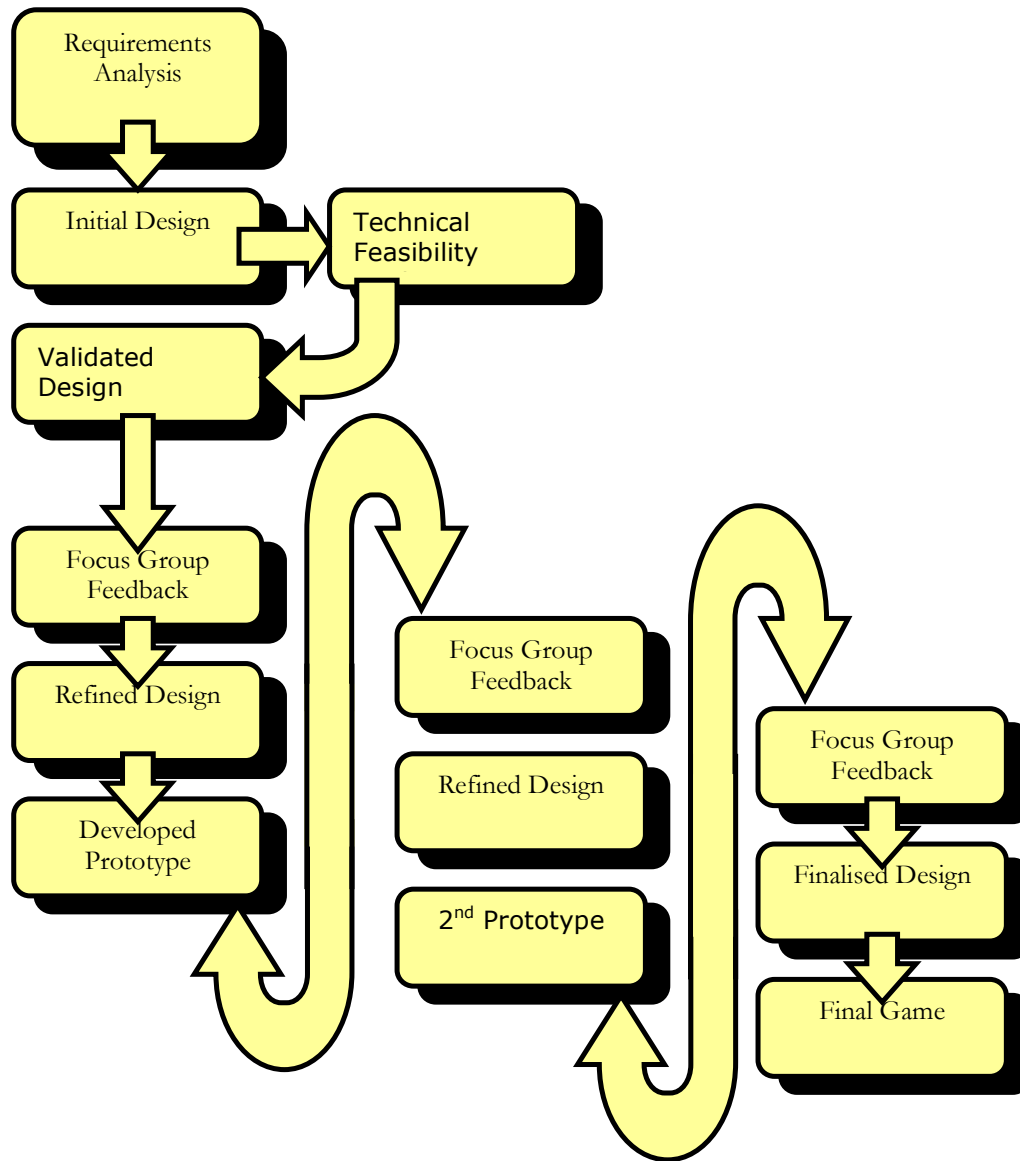


Figure 3: Iterative, 4DF based development example

The model shown in Figure 3 is broadly generalisable to other game designs. A 3-iteration development process would seem optimum given the timeframe of the e-VITA project and other constraints, although this may be revised as a result of technical analysis.

Returning to the 'point and click' idea, it can be related to the other 4DF concepts more directly. The context and learners as defined by the e-VITA project remain constant across technologies and game design paradigms, and thus the general points raised in Section 2 remain valid. With particular reference to supporting materials, the game format may allow their inclusion through in-game links or content (such as books and other documents from the period available as in-game items). The representation of content raises interesting questions that could be explored by focus groups, such as whether to aim for animated, cartoon-like content, or photo-realistic scenes. In addition, the ways in which dialogs between the user and other characters are handled, and the linearity of the storyline, raise further topics for analysis. One of the most challenging design issues using this genre model will lie around making the humour aspect of the stories and game effective for the various target audiences, and the localisation process is likely to lead to branching game development as previously mentioned.

The next and final section assumes a 3-stage iterative development process, and illustrates an approximate timeplan and workflow for the e-VITA project based on this assumption. It does not, however, place any constraints on the technical platform chosen for development or the game design itself – although, as this document has stressed, the four dimensions of context, learner, pedagogy, and representation should be reflected upon at every stage of development. Whilst this section has related the methodology to an example of a potential genre for the design



5 Workflow and Timeplan

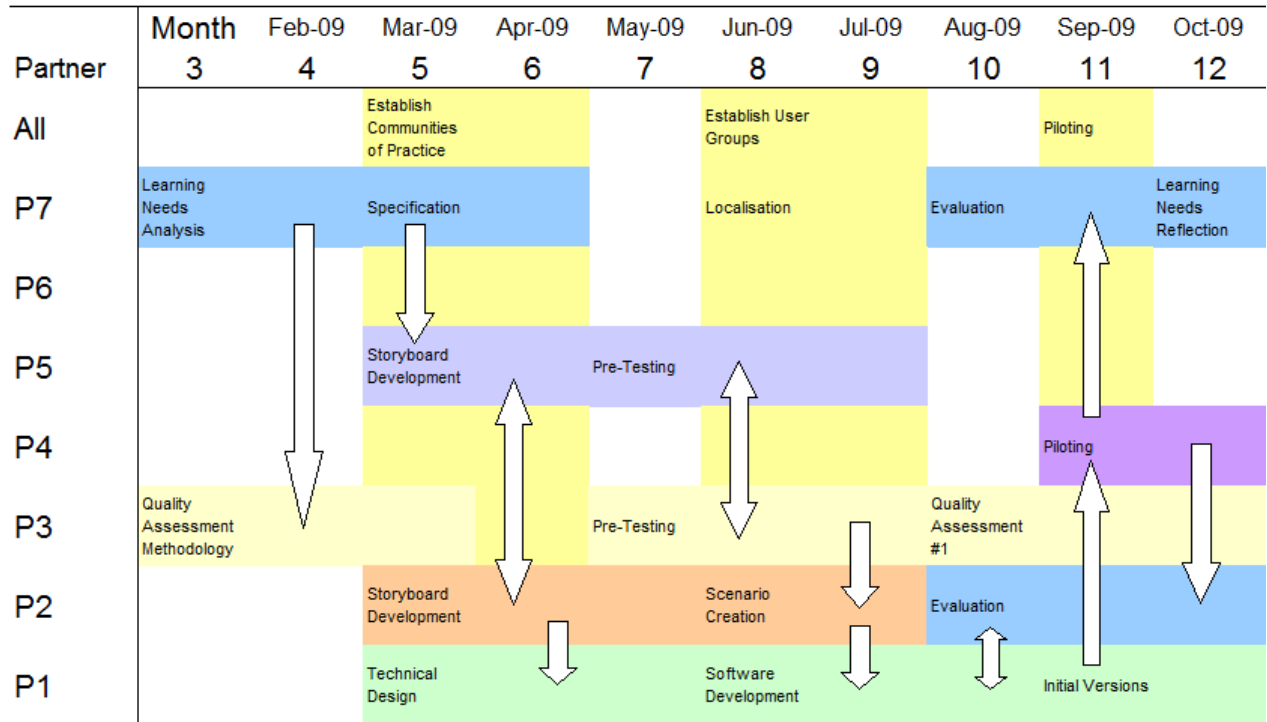
5.1 Introduction and Overview

The timeplan is included in this section for reference purposes. It identifies workflow by considering the activities of partners over time, and reflects the various work packages. Under the plan, the main first-year activities required by all partners are the formation of communities of practice by the end of month 5 (consisting of approximately 8-10 senior citizens), the formation of small test groups of end-users in month 9, and assistance in piloting prototypes of the game software with larger user groups in month 12. These early pilots will be used to analyse the effectiveness of the game design concepts in achieving their specified goals of motivating and encouraging learners. This process will be repeated in light of the outcomes of these pilot studies; with communities of practice and user groups being reformed in the second year to provide any additional input or testing identified as necessary by the evaluation process.

It should be stressed the first series of user tests are not intended to be conducted with a 'finished product'; rather they will test the aspects of the games most likely to prove difficult to design effectively, and in the case that working simulations for some aspects of the storyboards have not yet been developed, be used to obtain qualitative survey data regarding their background and needs. Ultimately, this revision will result in a more effective finished product by involving users earlier on within the development cycle.



e-vita project timeplan and workflow

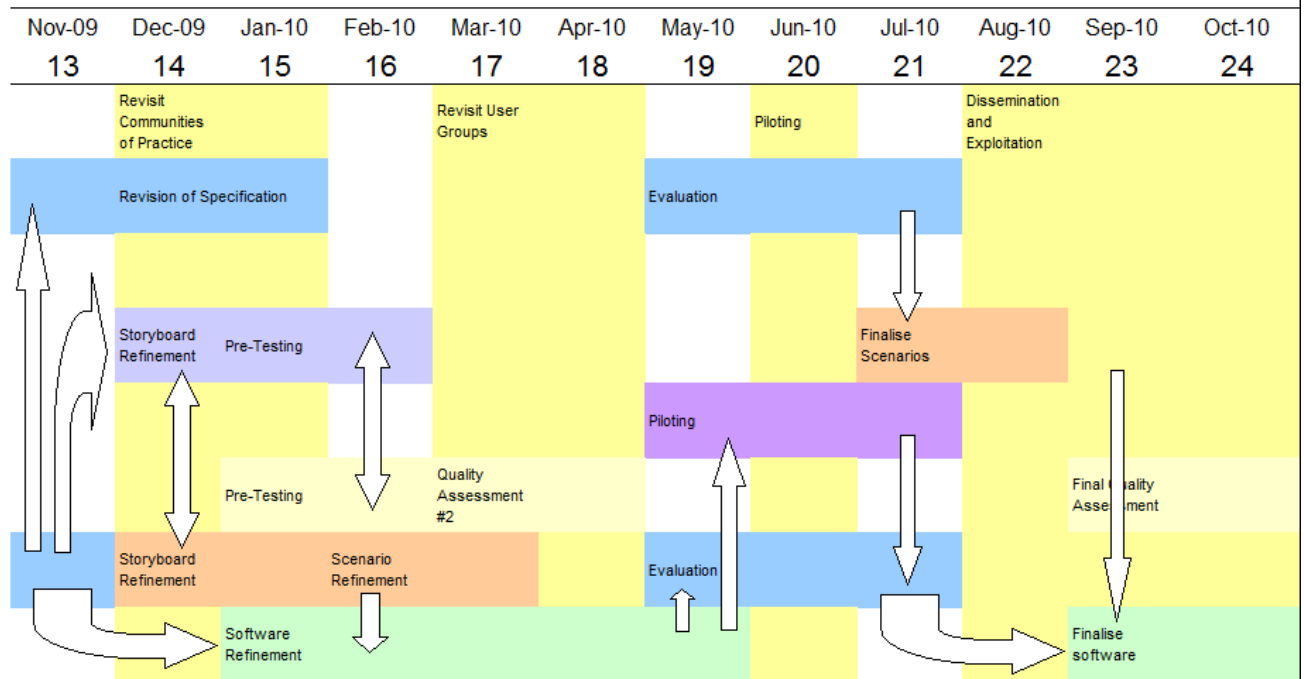


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6 References

- [1] de Freitas, S., (2006b). Using games and simulations for supporting learning. In C. Martin & L. Murray (Eds.), Learning, media and technology special issue on gaming. 31(4) (pp. 343–358).
- [2] de Freitas, S., & Jarvis, S., (2006). A framework for developing serious games to meet learner needs. I/ITSEC Conference, Florida, USA.
- [3] de Freitas, S., Oliver, M., Mayes, T., & Mee, A., (2007). The practitioner perspective on the modelling of pedagogy and practice. Journal of Computer Assisted Learning.
- [4] Edey, D. (2002). Young people and citizenship in the European union, in Ross, A (ed) Future Citizens in Europe. London: CiCe, pp 39-44
- [5] Vygotsky, L.S., Mind in society : The development of higher psychological processes. 1978, Cambridge, MA: Harvard University Press.
- [6] Bruner, J.S., Vygotsky's zone of proximal development: The hidden agenda, in Children's Learning in the "Zone of Proximal Development", B. Rogoff and J.V. Wertsch, Editors. 1984, Jossey - Bass: San Francisco. p. 93-97.
- [7] Montessori, M., The Montessori method: scientific pedagogy as applied to child education in the children's home. 1912: Heinemann.
- [8] Stommel, A.J. and V.R. Fu, Teaching in the zone of proximal development: implications for responsive teaching practice. Child and Youth Care Forum, 1993. 22(5): p. 337 - 350.

Document Control

Amendment History

Version	Baseline	Date	Author	Description/Comments
1.0		7 th April 2009	ID, GRM	First draft, available for comments
2.0		17 th April 2009	GRM	Incorporation of Appendixes describing and presenting results of preliminary, user-centred studies
2.1		28 April 09	LPannese	Minor changes
2.3		8 May 09	GRM	Incorporation of the results of focus groups by IMA and ILI

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7 Appendixes: Preliminary user-centred studies

7.1 Appendix 1 Focus group with three 17 years-old about serious games

Milan 25th February

PARTICIPANTS:

Lucia Pannese (IMA)
Linda Confalonieri (IMA)
Francesca Vender (IMA)
Giulia Maggi (IMA)

Andrea Favaro
Mario Ferretti
Jan Bottaro

TOPIC:

Feedback on perception, use and desires about SG in general interesting scenarios for a story about the EU

SUMMARY:

The interviewees said that the game can be involving if it encourages them to set up a strategy to reach a certain goal. This should be the basic principle for the development of the game. We have thought about several scenarios, but all of them have the same features: the game should allow the player to “manage” a situation and perform different “active roles” (from the politician to the worker).

LC: Moreover, subjects highlight the importance to have a **specific goal** within the game such as surviving, growing, conquering nations, writing a news, story etc

The theme of a cross-border journey in Europe before the integration can be interesting only if integrated in wider and more complex context, such as the story of a journalist that has to collect testimonies to write an article on this subject, or the story of a spy fleeing from a county to another.

As regards to share the game with boys and girls of other countries, a possible solution can be a “multiplayer game”

The “multiplayer dimension” can be implemented as a corollary to the games, in form of:

- a chat where the players can communicate (the chat line is preferred to the forum, that is considered too slow – but which could anyway be useful for other purposes)
- a space with classification and charts of the results of the players (e.g. best performers, grouping national results...)

TARGET AND PERCEPTION

An impression is that we should design a highly technological serious game to make boys and girls between 18 and 25 years old more involved and interested in the project, because they are used to videogames, which are based on an highly sophisticated technology but have usually no or little content.

In this case the style of the language and of the content is more important than the technological structure itself (that still remains important for other aspects of the game, i.e. the graphics)

LC: From my point of view, this male sample of possible target group showed high expectancies both in terms of contents, as well as graphic and technological aspects. They seem strongly motivated in performing games where they can: 1) entertain themselves with fighting; 2) learn new competencies in terms of economics and political management (such as being a President and make decisions about the country, or being an important business man making choices about economics/import-export strategies); 3) assuming the point of view of other soldiers (e.g., from others factions) in a war-context; 4) assuming the point of view of students or worker in Poland during the '80s (even though less exciting than the previous points).

The basic assumption is that it is necessary to have a sort of long-term story or objective (as FV writes as follows).

POLITICAL ASPECTS, ECONOMY, WORK, LIFESTYLE: THEY WANT TO KNOW HOW A PROCESS ORIGINATES, GROWS, IS DEVELOPED AND DECLINES TO HAVE GUIDELINES AND INFORMATION ON HOW TO BEHAVE IN ANOTHER OCCASION. WHAT IS CORRECT AND WHAT DOES NOT WORK IN DIFFERENT SITUATIONS. (FV)

KEY-WORDS

The key words that the boys said most frequently are: war (highly recurrent theme) strategy and management (important aspect for the game), interactivity (to communicate with other boys and girls in other Countries, "multiplayer"), involvement (the game should involve, not be complicated or intricate), goal (the game should have a final goal that the player have to reach –possibly with a final score).

IN MY OPINION THIS SENTENCE WAS IMPORTANT: "I'M HAPPY/SATISFIED IF I HAVE THE POSSIBILITY TO CHANGE REALITY" (FV)

FEEDBACK IS FOR THEM THE "RATING" (AS IN E-BAY) (that THEY give to the game)

WHAT WE UNDERSTAND AS FEEDBACK IS FOR THEM THE GAME'S SCORE (FV)

LC: "To get involved in the game I really need to like and be interested and in the contents" (then I agree with yours opinions).

SCENARIOS

Several scenarios have been suggested as setting for the game or just as hints: at the beginning the interviewee suggested a war-context or the control and management of a town or even a whole nation (in this case the player can perform different roles, i.e. politician, journalist or worker) and then, after being advised to think about the theme "lifestyle", they suggested other more common situations such as a discussion about different issues and topics in a library or a house or another place where boys and girls can meet. The spying scenery that Linda suggested at the end of the meeting is very interesting.

METAPHORS: A JOURNALIST THAT HAS TO WRITE 5 ARTICLES, A DIRECTOR THAT HAS TO MAKE A FILM AND AIMS TO WIN THE CANNES FILM FESTIVAL, WRITING FOR A NEWSPAPER THAT PUBLISHES CURRENT EVENTS ARTICLES, INTERNAL AFFAIRS NEWS ETC. (FV)

OTHER

The boys seem more interested in knowing past events of their own country rather than of foreign Countries.

The idea of a "tutor/guide" represented by a character or a voice-over is appreciated, but he/she must be a person that is informed about the story, for example a grandfather or grandmother, as Francesca suggested. Possibly with the real voice of the person who gave their testimonies.

However, the role of a tutor/learning companion following them during the path is not appreciated. It would be better to have the opportunity to call his/her help when necessary.

Importance of having a time-limit to finish the game: the boy also suggested to divide the game in different parts, of 10 minutes each for example.

They seem to prefer both voices and typed words within the games.

COMMENTS

LC: In my opinion, too much focus on 1939-1950 range of years. We should try to make them move towards '60, '70, '80, more slight but more interesting (to the project's aims) differences in life style, economy, politics and sociology.

7.2 Appendix 2 Focus group with three 22 years-old female and two 22 years-old male young adults, about serious games

Milan 3rd March

PARTICIPANTS:

Linda Confalonieri (IMA)
Giulia Maggi (IMA)

Silvia Meregalli
Francesca Cataldo
Daria Vigani
Paolo Piacentini
Emanuele Dagrada

TOPIC:

Feedback on perception, use and desires about SG in general interesting scenarios for a story about the EU

SUMMARY

The interviewees said that in general the topic of “European cultural games about cross-border experiences of older Europeans” is not extremely interesting for them. Also females are generally not used in playing video games.

Participants highlighted that, since they are 22 years old, they experienced both life before and after the EU integration. Even asking them about the '70, '60, '80 they said they won't be interested in playing these games where the focus is on “lifestyle and cross-border experience” (boring).

Investigating other issues, it emerged that they would be interested in deepen the II World War period, in terms of “sharing the point of view of a person living in that condition”.

Interviewees said that they wouldn't spontaneously search and play this kind of serious games; however, if asked (e.g., from a professor after a theoretical lesson) they would play these games. However, expectations in this setting are high, since it is required that serious games let them experience what they learned from the lesson, in terms of political, economical and historical aspects.

The key aspect is that serious games should involve **balance between political, economical and historical (and a bit of cultural) issues** in depth and examine these aspects **in a very specific way** (they already know the basics of history, old currencies, etc.,).

Of course it is important to have goals to achieve, some strategic aspects (my choices will affect my future in the game). The basic assumption is that it is necessary to have a sort of long-term story or objective, being a character playing a role, etc.

They found it interesting to have a multiplayer context with also foreign mates and speaking English with them won't be a problem.

TARGET AND PERCEPTION

An impression is that the topic of stories before the EU integration is not very interesting and exciting for this target. However, if there is an informal/formal request to play, they might be more involved with these games. One of the males and one of the girls seemed a bit more disposed to play these games.

It would be nice to have final scores and context with other mates.

This sample of possible target group showed high expectancies and they seem strongly motivated in performing games where they can: 1) **assume the point of view of persons living in a war-context or in difficult historical/political situations**; 2) deepen **specific economics and political aspects** (if asked to play, not spontaneously!); 3) gain competencies for their future work: e.g., being a broker and managing clients, and difficult crisis situations and **understand via games how the market react in some crisis or boom situations (better if the current situations)**.

Few of them found the "spy" idea interesting.

No interest for "easy stories" about cross-border trips, currencies, or communications.

A bit of interest for multicultural aspects (even though not really inside Europe, but more for Muslims cultures, etc.).

KEY-WORDS

The key words that the young adults said most frequently are: **balance** between economics, political, historical aspects; "human aspects" (thoughts, feelings, emotions, behaviours)

SCENARIOS

Some scenarios have been suggested as setting for the game or just as hints:
being a person in a difficult war situation (or even living in a country with political difficulties) which need to go in another country; being a broker managing difficult economic crisis and exchanges with other countries.

OTHER

The idea of a "tutor/guide" represented by a character is fine, but only in some part of the story.

However, the role of a tutor/learning companion following them during the path is not really appreciated.

3D graphic is considered important and of added value if the topic is a bit boring.

Range time for a single game-session: 10 minutes

7.3 Appendix 3: Perceptions of e-VITA project among university students

Study carried out by imaginary on the 11th March 2009 at the University "Università Cattolica del Sacro Cuore".

Cattolica University, Milan 11th March

Lesson: Communication Psychology

N. students: 38

Participants:

Giuseppe Riva - UniCatt

Linda Confalonieri - IMA

Giulia Maggi - IMA

38 Students

Topic:

Perception, use and desires about video games and SG in general

Perception of future "ideal" E-VITA serious games

Section A: target characteristics

Section B: target perception of the e-VITA project

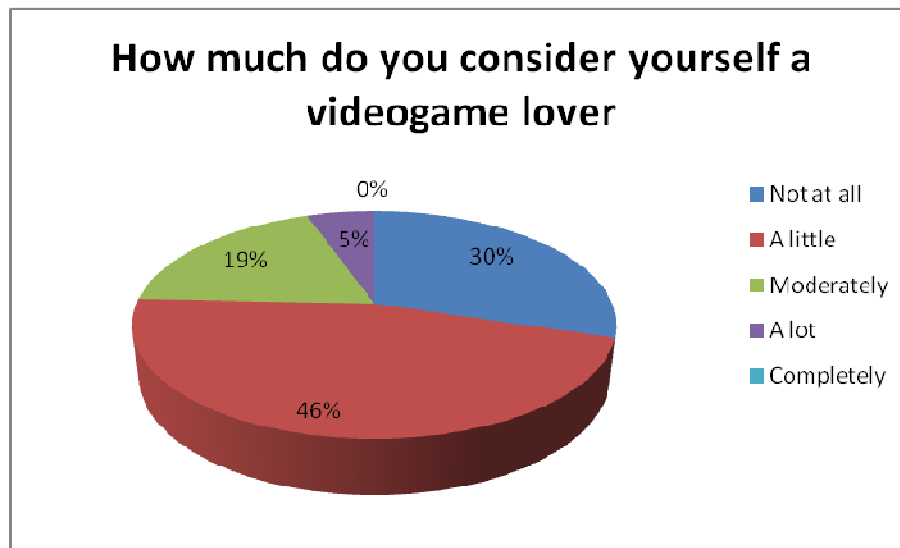
Section C: target perception of the "ideal" e-VITA serious game



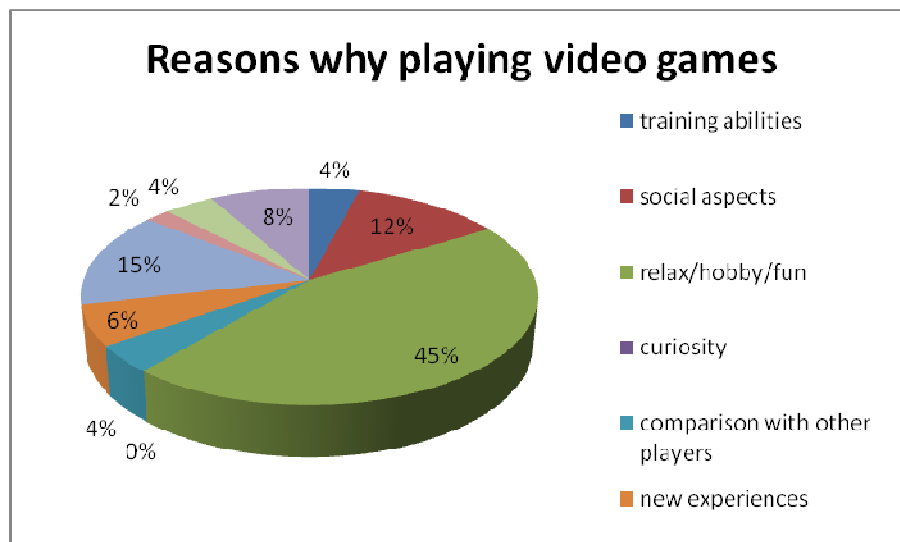
7.3.1 Section A: Target characteristics

The participants were students attending the Communication Psychology course with a **Mean age**: 21 (St. Dev. = 0.8). 30 participants were female and 7 were male. The answers to specific questions are presented next in the form of pie charts.

1. How much do you consider yourself a video game lover?



2. Reasons motivating to play video games:



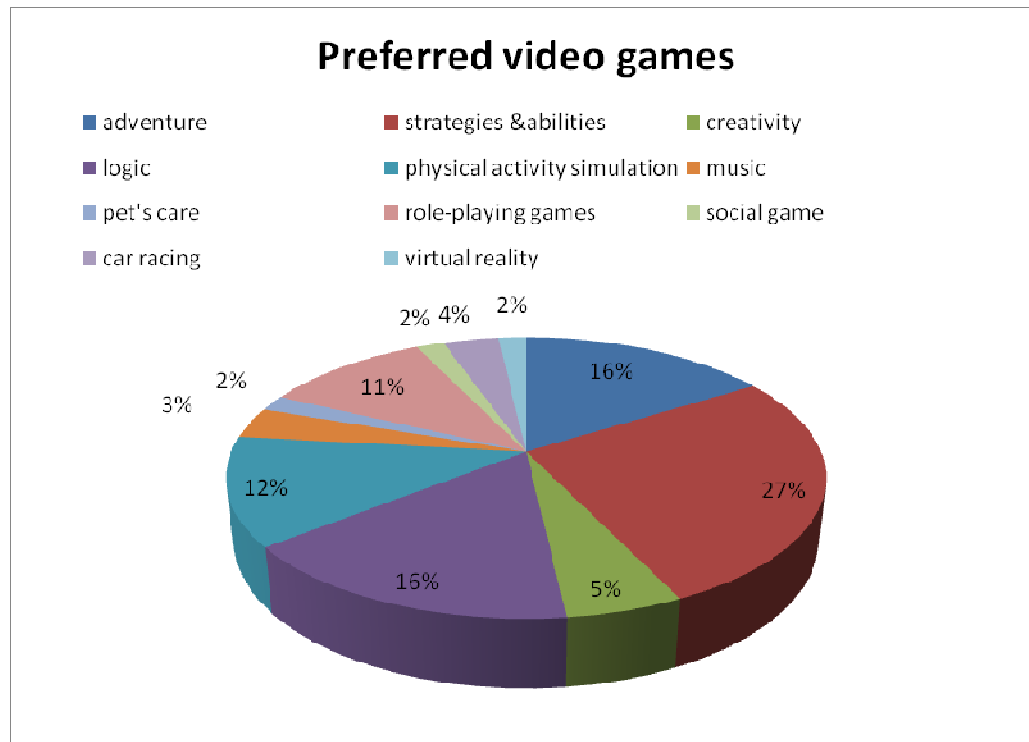
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3. Types of preferred video games:



4. Features of an exciting video game:

- curious
- being a new character in a specific new situation
- aimed at improving my abilities and skills
- requiring efforts and intelligence, but in a good balance (in some cases with graduated difficulty)
- catchy graphic
- catchy contents and stories
- able to elicit emotions (e.g., affective relationships between the characters)
- easy and intuitive usability
- highly interactive
- realistic and immersive
- competitive
- fun
- short in time
- with many choices
- lively

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- make yourself able to create something
- with several levels and goals to achieve
- possibility to create the initial scenario and the character
- providing rewards

5. Previous Serious Game experiences: 0%

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7.3.2 Section B: Target perception of the e-VITA project

1. Interest and availability to play e-VITA serious games in the future:

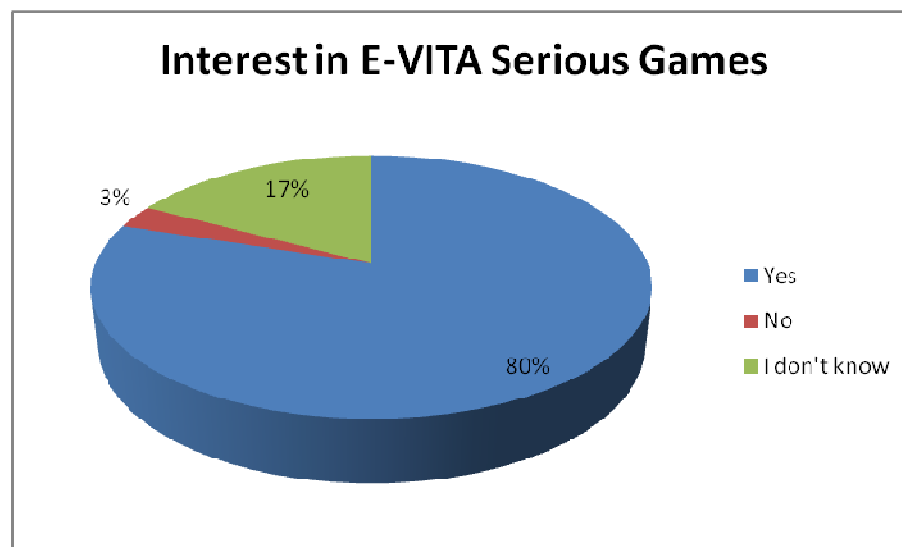
Yes: 80 %

Reasons: curiosity; new experience; experiencing different lifestyles of the past and cultural aspects; putting themselves in the shoes of other persons; appreciating the current advantages and disadvantages regarding the European Union; becoming aware about the differences before and after the European Union and between different countries; acquiring new knowledge; just experiencing a serious game; playing is always fun!

No: 3 %

Reasons: indifference to European Union issues;

I don't know: 17 %



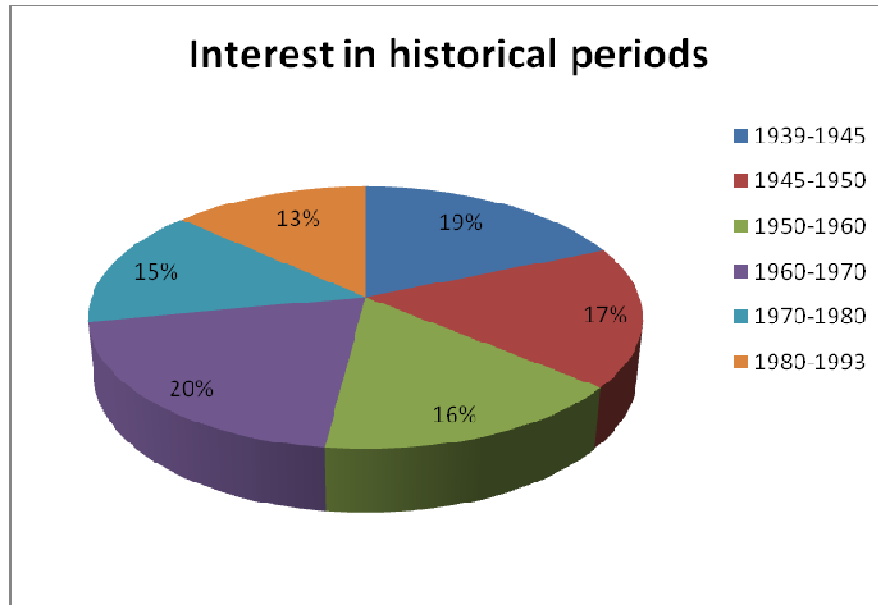
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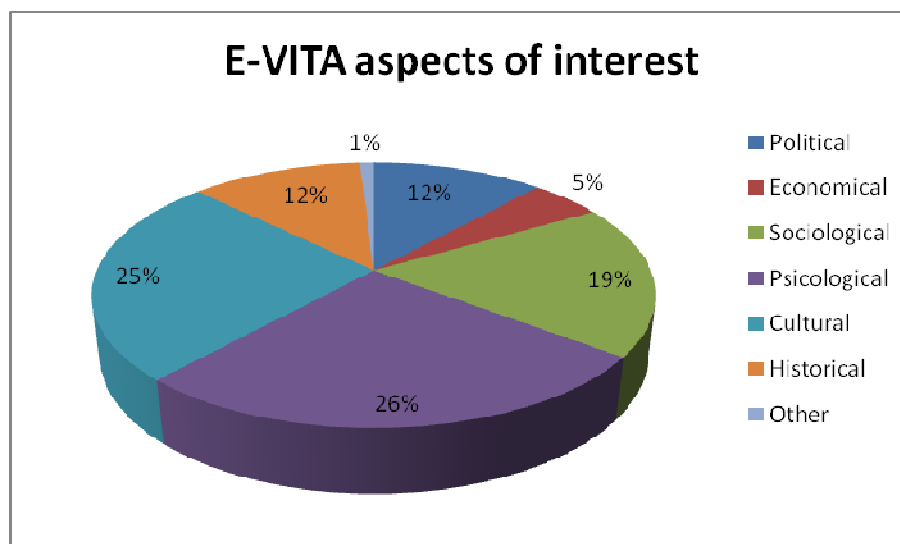
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2. Periods of time (20th century) of special interest:



3. E-VITA aspects of special interest:



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7.3.3 Section C: Target perception of the “ideal” e-VITA serious game

Ultimate aims of the serious game:

- Raising awareness to traditional and past values and different periods and past life experiences
- Raising awareness to multicultural issues
- Training of soft-skills contextualized in the sixties (e.g., becoming a hippie community leader)
- Training of hard skills for future professional fields
- Raising awareness to and taking the point of view of population in difficult political situation in the past (dictatorship, absence of freedom of worship, of speech and expression, of press, etc)
- Improving foreign languages competencies
- Training IT skills and understanding the influence that different technologies might have/had on the daily life and individuals’ mental models (before EU differences in IT technologies)
- Acquiring knowledge about the political situation in specific periods (e.g., 1968)
- Sensitization to eating habits (before the EU)
- Raising awareness to alternative and different amusement opportunities in the past

They proposed, as ideally interesting games, games with the following goals and scenarios:

- An elder person and a young adult have to walk along the same path towards some places of interests (like squares, parks, trenches on the mountains, etc) and going back in the past;
- Becoming a hippie community leader in the sixties
- Going by car with other foreign mates to a foreign country : crossing borders and speaking a foreign language to talk to the travels' mate
- Being a person living in a state under dictatorship
- Living the past daily life in its different aspects
- Coping with a specific problem in a daily life context taking the point of view of a foreign citizen (e.g. Polish)
- Living in a different county in a past period
- Helping an immigrant to integrate himself/herself in our culture before the EU union (different norms about immigration and cross-boring)
- Living specific amusement opportunities (like parties) in the past
- Organizing a bicultural wedding
- Becoming a very famous, well-known or successful person (mentioned 3 times)
- Being involved in politic protest in specific years

Characters:

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The following trends emerged:

- characters built up and selected by users;
- principally human beings in several contextualized daily situations;
- persons from other cultures

Scoring and feedback:

Most of them would assign a score or a feedback. Specifically:

Pre-game and post-game assessment using self-reports

Most of them like the presence of different levels in the game: feedback at the end of each game level.

Feedbacks may be a sort of virtual gift or a numerical score.

Graphical aspects:

The majority of subjects showed preferences for a 3D, rich and immersive graphic.

Mainly human beings as characters of the serious game.

Other

Some students were interested in deepening the e-VITA and serious games issues, so that they will be involved in a focus group.



7.4 Appendix 4 Focus group with two 16 year-old boys, one 13 year-old girl and one 11 year-old girl

Erlangen 3rd March

Meeting – focus group with two boys age 16 and two girls age 11 and 13 about serious games

PARTICIPANTS:
Sonia Hetzner

Nico Hetzner
Jorke Neufang
Maria Hetzner
Nadine Bush

Topic:
Feedback on perception, use and desires about SG in general
Interesting scenarios for a story about the EU

Boys both 16	Girls 11 and 13
Strategy games more interesting	Taking control for something or caring for
Getting more power for the figure playing	Collecting things
Competition is very important	Competition very important
Multiplayer is important	Multiplayer not important
Target - something to reach	Target/ a task to solve
Spontaneous decision (GTA – Gangster)	Levels are very important
2 D games are boring, unprofessional. 3D is very important	2 D could be ok
Educational part must be hidden	Educational part must not be hidden
Control: being a figure of the game (role playing), or the perspective from above	Control: being a figure of the game (role playing), or the perspective from above
Pressure and rewarding system are very important	Pressure and reward are very important
Interesting topics: Younger ages as 2 nd world war, historical things, but things they know about: The “hot” seventies in Germany, travelling, music of the 70ies, Berlin-Wall)	Interesting : Information on a certain country. Play being a spy, journalist or even a politician Also something like “Who wants to be millionaire” with an explorative part?