ABSTRACT
This paper documents the design and development of a Flash-based Baroque music game, “Tafelkids: The Quest for Arundo Donax”, focusing on the tension between constructing an online resource that an audience aged 8-14 would find fun and engaging, and the directive to include historical information and facts, as well as convey some of the sounds, musical structures and conventions of Baroque music, history and culture through play. We begin by contextualizing the game as a collaboration between our team of university-based researchers and the Tafelmusik Baroque Orchestra, two groups with quite different histories – and understandings - of educational media design. We introduce the problem of how to go about creating a media artifact that would “make public”, in a compelling and playable way, key features of Baroque music. We then describe a design process in which we tried to bridge the representation of “expert knowledge” about Baroque music with some of the mechanics used in popular music-based games. A discussion of these particular challenges in designing a bridge from propositions to play, in effect digitally re-mediating, Baroque music education, concludes by addressing the broader epistemological question of what and how we may best learn, and learn best, from games and play.

Categories and Subject Descriptors
Future game impacts and applications

Keywords
Educational/serious games, Flash, Baroque music, play and learning, design-based research

1. NEW MEDIA, NEW AUDIENCES
In today’s super-saturated, socially networked, ‘second-life,’ massively multiplayer, online, keyed-in, content generating, 2.0, ‘glocal’ culture, the world of Baroque music, to many people, not only feels like a relic from an inaccessible past, but it often looks that way as well. Just take a peek (in Canada, at least) into a public, fee-based concert with “Baroque” in the title and you’ll have your proof: rows and rows of silver-haired, distinguished-looking older people who are clearly less “wired” than, say, your average cinema audience – there are no reminders here to turn off your cellphone. So how does a group like the Tafelmusik Baroque Orchestra, based in Toronto, create an audience of appreciative, and informed younger listeners? In their case, they do an enormous amount of public outreach: Baroque education days for school children, the creation of a curriculum for teachers that matches specified ‘outcomes’ for provincial standards, the production of an award-winning CD for kids, and now, the undertaking to use the media that many youth (especially boys) are still so fascinated with – videogames. A medium that attracts so very different an audience than the one typically attending Baroque concerts, Tafelmusik recognizes, could become a powerful site for the educational development of new audiences.

This paper documents the design and development of a Flash-based Baroque music game, “Tafelkids: The Quest for Arundo Donax” focusing on the tension between constructing an online resource that an audience aged 8-14 would find both fun and engaging, and the directive to include historical information and facts, as well as convey some of the sounds, musical structures and conventions of Baroque music, history and culture through play. While the tension between an educational game and its ‘curricular content’ (facts, figures, information) is not a new one [4, 8, 18, 19] what we attempt to document here is the process of working through that tension in order to reach an audience that might not be particularly disposed to Baroque music.

We describe the various elements of the game, including the overall learning environment and mini Flash games, and their contributions to learning about Baroque music, and we highlight some of the different expectations between our design team and our client, in terms of what ‘counts’ as knowledge in a game meant to cultivate an appreciation for music. Similar differences were encountered, though to a lesser extent, in our user-testing sessions with children aged 12-13. We conclude with an account of some of the difficulties we had in re-conceptualizing educational ‘content’ in the transition from one medium (sound, in the case of the TafelKIDS CD) to an interactive, multi-modal, and highly graphical medium, and consider from this standpoint broader questions concerned with representation and epistemology.
2. MAKING KNOWLEDGE PUBLIC: INSIDER KNOWLEDGE STEPS OUT

Baroque music, while enjoyed by many (Vivaldi’s “Four Seasons” as elevator music) is not necessarily a field or subject area with which many among ‘the public’ would be more than obliquely or shallowly familiar. And, while we might know something about the likes of Bach, Purcell, Vivaldi or Handel, we might not necessarily know what particular instruments make up a Baroque orchestra, nor would we be armed with the knowledge of the differences between a Baroque bassoon and its contemporary cousin. So when we, as educational game developers and researchers, began the project of creating a digital game about Baroque music, history, characters and instruments, we realized that we would have to become well-versed in a highly specialized discourse and subject matter ourselves, and that we would have to find ways to make it intelligible to a lay audience, (in this case, children aged 8 to 14).

Not only were we attempting to straddle the distance between insider and outsider knowledge of Baroque music, reconfiguring it for the graphical medium of a digital game, but we were also faced with the problem of taking a rather traditional curriculum concerned with Baroque historical figures and instruments and translating it into play-based learning activities capable of meaningfully engaging youth for whom whatever is past is ‘boring’! The two primary epistemological issues we had when developing the game were based on the above problems: a) how to take the highly specialized discursive and skill-based practical knowledge of a professional Baroque musical group (Tafelmusik) and represent it in the form of a game for children, and b) how to convert their educational objectives into both play-based and knowledge-based digital media, which included not just practical knowledge (e.g. of instruments) but also historical knowledge (e.g. of composers, European culture at the time, etc.), as well as introduce through interactive activities the very essence of Baroque music – with its core characteristics such as tempo, orchestration, continuo and notation styles.

In the first case, there were three primary spheres of knowledge that Tafelmusik, as the organization that commissioned us to design the game, wanted it to cover: an historical understanding of Baroque music, including notable historical figures, instruments, and costumes; a practical understanding of Baroque music encompassing instruments, instrumentation (voices, continuo), and composition; and an opportunity to access and gain some familiarity with, and enjoyment of, Baroque music.

With these primary goals in mind, we began by first informing ourselves: what instruments make up a Baroque orchestra, what is ‘Arundo Donax’, who were the primary Baroque composers… and so on. We were given a kind of script to work from in the form of the Juno award winning CD that was produced by Tafelmusik for children in 2006 with the same title, ‘The Quest for Arundo Donax’. The CD tells the story of the two children of Henry Purcell who are charged by Queen Anne during England’s war with France to travel to the court of the French king Louis XIV to acquire the special bamboo (its Latin name being Arundo Donax) from which high-quality reeds were made (and are still made today).

The narrative takes the children through Venice and a visit with Vivaldi, and then places them in Versailles where they are granted access to court and fulfill their quest for the scarce reed. It was through this narrative that we confronted our first challenge: how to take this very time-specific, quest-driven, linear narrative and build a Flash game around it. Embedded within the CD narrative were geographical and historical timeline constraints. For example, most music at the time was highly localized, so the court of Queen Anne might be listening to Purcell compositions, but their musicians certainly were not playing pieces by Louis Lully. And, while Bach (certainly one of the primary and most identifiable Baroque composers) was alive and composing, in 1704 he had not yet established himself in Leipzig; so even if we expanded the narrative to include that relatively known musical center for Bach’s compositions, we were too far off on the date to be historically accurate.

So here, we came up against a constraint around a narrative that worked very well as a “story” in a non-interactive medium but which, in its adherence to a particular historical time and place, left little room for the kinds of open-ended and non-linear exploration such a medium afforded. In the end, we departed from the details of the original narrative, but left it in place as an overarching goal of the game, which allowed us to move to a less linear narrative structure that granted a greater degree of freedom and choice characteristic of digital games. This, in turn, meant large concessions in terms of historical dates and timelines and geographical localization of music – strict historical fidelity gave way to play. What we settled on, then, was a hybridization of the story: Purcell’s two children would become the game’s ‘playable characters’, and would travel (by virtue of mouse clicks on a map) to destinations which had previously been part of the original narrative – Venice and Versailles – which would become the locations of small ‘mini-games’. These mini-games would allow for some of the knowledge-building that Tafelmusik sought from all three angles: historical facts, instruments and instrumentation, and musical knowledge and appreciation (see the next section for a fuller accounting).

Content supplied by Tafelmusik, which was not directly related to the game (and the narrative) presented our second major obstacle. How could we use information on select instruments and composers, including obscure facts on their contributions to Baroque music; that, for example, “Vivaldi uses the form of a solo concerto with alternating orchestral and solo sections but stretches the normal form by using the instruments to portray these dramatic effects” (p. 8). In order to fully understand that sentence, one must be familiar with specialized vocabulary (solo concerto, orchestral sections), as well as historical composition – and what is the “normal form” that is being “stretched” here?

Our project became then, not one of cut and paste (which is all too often the case), but one of careful, time-consuming re-designing of propositionally-organized content to better suit this online medium [5, 8, 9], and of ‘high-brow’ culture to an audience of ‘popular’ knowledge and taste. This quite often entailed altering the key information that was presented, making it far less detailed and/or specialized and far more accessible to those unfamiliar with traditional musical instruments, and untutored in Baroque music.

For instance, Tafelmusik’s “Baroque Learning Centre” website (http://www.tafelmusik.org/flash/learningcentre/index.html#), offers an overview of musical instruments and composers which we were to incorporate, if not in a game format, then in a kind of extracurricular format. We decided this information was best left
secondary to the game itself, but we incorporated it as an embedded interactive feature (see section 3.1). What was not possible, however, was to directly cut and paste ‘content’ from the learning centre site into the game: what was to be learned simply was not conveyed in a way that would “make sense” to the game medium, or to its intended audience. Consider the bassoon: On the learning centre website the bassoon is thus described:

The baroque bassoon has a much larger and more conical shape bore than its modern counterpart, and requires a larger double reed to produce proper tone. These features give the baroque bassoon more flexibility of articulation as well as a softer, less concentrated sound. This makes it ideal for blending with the cellos and bass, which is its usual function as a member of the continuo section of the baroque orchestra.

Rewritten for our purposes, there is a qualitative difference in the information being imparted. We wrote:

The baroque bassoon is hollow wooden instrument. It is constructed differently than bassoons of today, for example, its “bore” – the hole bored through the instrument, was larger. The bassoon has the widest range (low to high notes) of any baroque woodwind instrument, a little more than two and half octaves, from B flat to G). Fun Fact: Bassoonists control no fewer than 13 keys with their thumbs alone!

The point here is that the information is not entirely different – a reader would learn in both cases that the Baroque bassoon is larger, but what they would learn in the rewritten text is what a bore is and would not be presumed to know what “flexibility of articulation” means, and instead are told, more accessibly for non-musicians, that the Baroque bassoon has ‘the widest range’, of two and a half octaves. The original emphasis on the relationship of bore and reed to tone, technique, and function by elite baroque musicians themselves, we converted into the more widely accessible and meaningful terms of musical range. We selected details which would convey something peculiar or surprising about the instrument, like playing 13 keys with one’s thumbs. This detail elaborates the ‘proposition’ we have taken as central (that only by the aid of many keys could such a range be engineered). We arrived at this necessary re-presenting of information precisely by being ourselves members of the ‘outsider’ public that is to benefit from making this insider knowledge available, following the design-based reasoning we mention earlier.

But these were the facts, and what seemed to us to be the primary objective of the game was to engage an audience, not with facts, but with Baroque music. In the following section we describe how we think we accomplished this through the various playable elements within a responsive game shell (which ‘houses’ the mini-games and where a player’s progress is displayed) and through four quite different mini-games that draw on currently popular and accessible gameplay mechanics to deliver relevant content in relevant ways for to a wider (and younger) audience.

3. THE QUEST FOR ARUNDO DONAX: DEVELOPING PLAYFUL APPRECIATION

After login, the player is taken to the main game screen. The game shell is a full-screen stylized map of Europe. On the map, narratively salient points of interest are clearly marked. On the first login, the point, which marks London, England, is highlighted, and players can click there, or on any other point on the map that is not gray (three mini-games are grayed out until the narrative is introduced by clicking on London). Once a player has clicked on London, the game, like the CD, “The Quest for Arundo Donax” begins in the court of Queen Anne in the year 1704. Henry Purcell, the former composer for Queen Anne’s court is dead, and his two children, Frances and Edward Purcell, are summoned by the Queen. A brief, sparsely-animated cutscene introduces the narrative, and gives the player their quest – to play the mini-games, fill out the musical score on the map (representing their progress through the games), and find the elusive Arundo Donax plant so the English bassoon and oboe players are able to make new reeds. After the narrative has been introduced, the player is invited to choose their ‘traveling costume’ and is taken back to the map from which they can navigate to other mini-games and content. The primary goal of the game is to fill in the musical score, unlocking tracks that can be downloaded and replayed. The following sections will describe each of the individual elements that comprise the game and conclude with a brief discussion from the standpoint of having engaged these questions concretely as well as conceptually, of some fundamental relationships between play and education.

3.1 Housing Content: A Baroque Game Shell

Given that, as we have indicated before, we had a significant amount of static content (historical figures, composers and baroque instruments) to be embedded somewhere in the site, and that we also needed, narratively, to convey a sense of movement, we created a map to house both the mini-games and much of the “curricular” content (Figure 1). This map was partially based on the original narrative that moved the characters from England to France, and on the original artwork that was created to accompany the CD. From the map, players access not only the mini games, but also the embedded content: historical figures and descriptions of baroque instruments.

The map, furthermore, indicates a player’s progress in the game, through a musical score (a kind of progress bar) that fills in as mini-games are completed. Historical figures and composers are explored by clicking on their location on the map, and musical instruments are perused through clicking on the interactive frame at the bottom frame of the map. Clicking on a dot on the map, for example, activates a short excerpt of music by a prominent Baroque composer born in, or associated with, that location (using Tafelmusik recordings). While listening to a sample of each composer’s music, selected facts and information come up in anime bubbles with background about that composer’s life and times (Purcell, in London, for example: see Figure 1). During the first activation of that content, a player cannot click away from the facts and musical piece, in effect, enforcing listening for the duration of the track, even if users do not choose to read the facts about the composer’s life. Once they have fully listened to the short musical track (with its associated information bubbles all displayed), players can click on and off music segments and information freely, to hear the musical excerpts again, or to remind oneself of information previously accessed.

This kind of enforced listening is meant to introduce the player, however briefly, to the broad musical repertoire that makes up the Baroque ‘canon’. Play occurs through the game shell in the form of basic interactive ‘call and response’, and it is here that the educational content is most didactically and heavy-handedly
served to players. Because we wanted an enforced structure of click-listen interaction to occur, the game shell seemed to be the primary place to house the ‘core curriculum’ content we were to encompass within the larger framework of the game, while the mini-games would convey important musical experiences and understandings less readily able to be delivered propositionally.

![Figure 1: The game shell](image)

3.2 The Baroque Orchestra Game

The primary objectives of this game are to learn about orchestration and the instruments that comprise a Baroque orchestra, and to distinguish between and among those instruments, on the basis not in ‘facts’ about that instrument (the objective of the game shell information bubbles), but rather upon the ability to recognize the sound of each, its distinctive voice and its characteristic contribution to the baroque orchestra, delivered through interactive orchestration combinations. For example, here we introduce players to the concept of the ‘continuo’ – the bass line upon which the melody is built in Baroque compositions, which is usually supplied by the double bass and harpsichord.

The training level of the game begins with the player listening (in whatever order they chose) to each of the instruments playing their own part of a larger orchestral piece. Once the player has listened to each of the solo voices of the instruments, the entire orchestra plays the piece, bringing each individual instrument’s part together – for which we also introduce small items of musical discourse (e.g. the command to play together: “tutti”).

In level one, players discern from a random selection of solo musical pieces which instrument is playing – capitalizing on the training level. Level one further scaffolds and attempts to tune the player’s ear to each individual instrument through concerto pieces. In level two, the vocabulary of multiple voices is introduced (duet, trio, quartet) and players are asked to try to identify, based on their distinctive sounds learned in prior levels of play, which instruments are playing together. In the final level, ‘free play’ is given to the player and they can arrange instruments in any order, attempting their own orchestrations with all the various parts available to them. The continuo is underscored when the player chooses the harpsichord and/or the bass to play in the free play portion.

Again, what we are trying to introduce in this game is the different instruments of an orchestra, the different sections and some of the different instrumental configurations. But we are trying to do this musically, not propositionally. Most of what’s to be learned through playing this mini-game is readily accomplished through trial and error on the part of the player as well as through replaying the parts that a player misjudges. What is distinctive here is the manner of presentation of the music itself, using this medium we were able to offer a de-composed orchestration, showcasing individual musical parts, allowing users to play with taking them apart and putting them back together. In this way, players can come to appreciate and indeed hear the orchestra, not only as a whole but also in parts, affording a completely different, and far richer experience of Baroque music. Having to get to know by ear the various parts of some astonishingly lovely music means you are more likely to hear not just separate individual parts or one whole, but the parts within the whole. While it remains to be seen whether this approach is effective in teaching basic musical understanding in a more embodied way, it is certainly the case that among the development team members, most were at the outset unable to distinguish different musical voices, but after interacting with the game, found themselves humming the several parts of the music, having effortlessly learned the various harmonies and melody through playing, and found that they were able, upon listening to very different music, correctly identify the instrument being played.

The Musical Inscription Game

While the orchestra game described above fosters attentive listening to subtle tonal and timbral differences between various baroque instruments using mostly passive interactivity (click-selecting of frames), the main objective of this ‘inscription’ mini-game is to introduce whole Baroque orchestral sections in an interactive way. Inspired by the popularity of rhythm-based games, in this mini-game, the player sees a moving horizontal timeline of an original Baroque score, in which some notes have been made ‘active’. The player has to click each ‘active’ note as it passes between two bar lines on the left side of the screen.

The primary concept and mechanics of this game comes from a lineage of several commercial titles including Guitar Hero, the most popular example, Osu/Tatakae!Ouendan! a Japanese handheld rhythm game, and a classical music rhythm game called Nodame Cantabile. In order to establish the parameters of our game with regard to the tension between play and content, we looked at the characteristics of these commercial games in terms of visual representation of music, mode of interaction/input – mouse, keyboard or physical controller, and how these different features contribute to playing the respective games.

While the representation of music scores varies from abstract static screen-based in Osu! and abstract moving perspective-timeline in Guitar Hero, in Nodame Cantabile, a Japanese, manga-based handheld game, players interact with classical music, and as well as a swirling, horizontal scrolling timeline featuring musical notes that they have to catch in time and hit with the stylus. Clearly, this last example informed our design the most, being closest in both music genre and use of notation. Another consideration related to using rhythm games was the effect of player actions on the musical track. In both Guitar Hero and Nodame Cantabile, players contribute a major part of the musical melody, and if not hit correctly, that corresponding section of music would simply not play, resulting in gaps in the soundtrack. In Osu! and its spinoffs, the music is supplied in whole and the
player adds accents such as hi-hat drum or cymbal beats on top of the existing track. If hit incorrectly, the accent does not play, but the rest of the music remains intact. In our case, since we deal with introducing a new audience to an unfamiliar genre of music – classical Baroque music – we did not want to compromise the musical experience by making its enjoyment contingent upon correctly hitting the notes. So we decided the music should play independent of player actions, and players should instead get a visual reward/confirmation for hitting correct notes.

This musical inscription game requires players to draw together information inscribed on a Baroque instrumental score with perception of a given note in time, and clicking its correct position on the moving score, as the designated notes are reached. Listening to the music helps players to learn to ‘read ahead’ in the score, and anticipate the next actions. The game begins with the player having to ‘fill in’ parts of a continuo, the fundamental musical baseline upon which Baroque orchestration is built. Upon successful completion of this training level, players can progress through difficulty levels featuring more complex arrangements and requiring the player to activate more notes. In the final level, the player is faced with concurrent scores representing two different parts of a piece – two parallel staves both containing notes that advance in time with the music, while active notes appear in either the upper or the lower staff.

To speak to the educational affordances that we propose this game offers, we have to return first to the rationale for using popular commercial game genres in an educational game context. Rhythm games use music in functionally, perceptually and interactionally different ways than other games do. While, too often, music soundtracks, not to mention soundscape components, are relegated to the periphery of games and serve a primarily affective function – complementing the mood of the player rather than supporting or advancing the gameplay itself – rhythm games require a listening attention and eye-hand (embodied) coordination that is unique.

To invoke Truax’s notions of listening positions – modes of listening attention that he argues have specifically developed alongside advances in technology and media soundscapes among others – the genre of rhythm games, and by extension our educational game example, move the listening position of the player from background or distracted listening to analytical listening [21].

According to Truax, analytical listening is only possible through the medium of electroacoustic reproduction, as sound is too ephemeral to allow for such scrutiny in its ‘analogue’ permutation. Analytical listening is a type of auditory attention that goes beyond affective appreciation and into subtle deconstruction of the basic building blocks of music – quality, tempo, timbre, flow, pitch and envelope, among others. Yet Truax’s point rests still on attentive non-interactive listening. Rhythm games offer another dimension for the player to connect to the music on a deeper level by involving the body and making it a visceral part of the music itself. It is a unique type of listening attention that we might call “participatory listening” or “internalized listening” referring to the importance of interacting with sound and the deeper level of connection it forms with the player.

3.3 The Gigue is Up: A Digital Baroque Dance game

After completing the mini-games described above, both of which involve players directly in digitally-mediated performances of Baroque music, players unlock the last mini-game which takes place in the Hall of Mirrors at Versailles – the court of Louis XIV, the ‘Sun King’. Here, the game’s narrative reaches its conclusion as players must literally dance their way into the king’s favor, so that he will grant them a supply of Arundo Donax to bring back to England.

As with the orchestration and inscription mini-games described above, play mechanics are modeled after a popular “music game”: in this case, Dance Dance Revolution (DDR). Like DDR and its multiple PC or web-based spin-offs (such as Stepmania and Flash Revolution), arrow icons move vertically across the screen and the player must press the corresponding arrow keys at the appropriate time (see Figure 2 for a screenshot).

Unlike other web-based games emulating DDR, however, where the action plays out across backgrounds of abstract visuals, characters actually dance around the screen in time with the music, meaning that players are actually ‘performing’ a digitally-mediated Baroque dance choreography. Arrow keys move the characters to the left, right, up or down, in a bending and rising motion (the Baroque styles of pié and elevé), while combinations of arrow keys and w, a, s, d buttons will move the character in the indicated direction while also executing either a pas assemblé, pas-coupe, demi-coupe, or pirouette.

Button prompts are synchronized to the downbeats of the musical tracks, so that as with real Baroque dance, characters perform a step with every beat. We enact different difficulty levels through different types of dances, each with its accompanying audio track: the relatively slow Menuet for the first difficulty level, the more up-tempo Gigue for the second, and the fast-paced Bourrée for the last and most challenging level.

Well-timed keystrokes result in characters moving fluidly in place; the constraints of time and budget did not allow us to develop more ‘realistic’ movement in 3D virtual space. “Misses” – pressing the wrong key, or mistiming a keystroke - cause the character to stumble but, unlike DDR (and music-based games generally), characters do not get boo’d off stage for missing too many steps (though a humorously stylized Louis IX grimaces at
flaws and smiles approvingly at successful steps, with an ‘approval meter’ to register his ongoing reactions), and players are evaluated on their cumulative performance after the dance is completed.

As with our other mini-games, this dancing game privileges a form of play which actually engages players in a form of Baroque cultural expression, rather than with an exposition of historical facts about Baroque dance. This is accomplished through the amplification of player input, which Poole [17] among others describes as one of the central pleasures digital games afford: with minimal, but timely input, the player’s character executes complex and fluid movements imitative of the grace, decorum and precision that were upheld as virtues of formal court dance (and dancers) of the time. Historical fidelity is achieved through representation and play: the stage is modeled after the Hall of Mirrors in Versailles, the characters’ motions around the floor invoke historically authentic Baroque dance patterns, the audio tracks are representative of the kinds of dance music favored by Louis XIV’s court, and the character animations themselves are modeled after videos of actual Baroque dance enthusiasts performing particular dances and steps.

As with other parts of the game, however, there was significant negotiation during the development of this particular mini-game between our design team, and the content experts brought on to consult with us. At issue was the level of technical sophistication and historical fidelity that a game meant to teach children the fundamentals of Baroque dance ought to include: should we be concerned, for instance, whether our game conveys the fact that musicians count the phrasing for a “Menuet” using two bar mini-phrases with three beats in each bar, whereas dancers count in units of six? And how would such a concern – which is deeply important to those who perform and/or dance to Baroque music – be represented in-game?

There was also some concern around whether to allow players who had selected the girl character, Frances, to perform the dancing game in her ‘traveling’ costume (which features pants, instead of the more historically accurate corset and broad dress motif of the other three costumes we designed for that character). Here, our ongoing concern with generating non gender-normative character representations in educational games (discussed at length in [5], in the context of a game we designed for health education) came into tension with a perceived need for historical fidelity: women wore dresses to court, and that’s that.

These are two small but significant examples of the kinds of considerations we had to balance when designing a game that was ostensibly for children, but received and supervised by Baroque music experts: two groups for whom what ‘counts’ as useful or engaging knowledge may not be the same thing. There was also some concern around whether to allow players who had selected the girl character, Frances, to perform the dancing game in her ‘traveling’ costume (which features pants, instead of the more historically accurate corset and broad dress motif of the other three costumes we designed for that character). Here, our ongoing concern with generating non gender-normative character representations in educational games (discussed at length in [5], in the context of a game we designed for health education) came into tension with a perceived need for historical fidelity: women wore dresses to court, and that’s that.

4. USER-TESTING

While our design process yielded divergent conceptions between the development team and clients regarding the importance of historical fidelity and ‘expert’ knowledge, particularly in the transformation to an interactive, graphically-driven medium, our user-testing sessions provided a different set of tensions. In these sessions, we invited summer camp attendees, aged 12-13, to play particular parts of the game, in same-sex pairs, for 30 to 40 minutes at a time. Participants were asked to narrate their impressions (and frustrations) as they played, and afterwards were asked a short series of open-ended questions: what did you like? What didn’t you like? What would you change? What might a person of your age learn from this game?). User-testers repeatedly expressed pleasure and excitement around the more play-driven dancing and musical inscription mini-games; three remarked during play that it reminded them of popular rhythm-based games like Guitar Hero and DDR. More often than not, participants opted to replay these mini-games when presented with the opportunity to return to the map of Europe (‘game shell’) and experience other parts of the game. Afterwards, when asked what someone of their age might learn by playing the mini-games, participants remarked that they communicated “history about the Sun King” and “dancing types of dances” (dancing game), “how different instruments sound” (orchestra game) and “how the music looked” (inscription game). While these remarks cannot be read as a decisive indicator of the game’s success as a learning tool, they advance the possibility, as we have argued elsewhere [4, 5] that the primary goal of educational games should be less concerned with communicating information and more concerned with developing affect - with keeping players pleasurably engaged in a space where educational ‘content’ is spread across all elements of design (from graphics, to play, to, crucially for this game, sound and music).

We were therefore surprised by the suggestions of some participants that the game include more information: one tester thought the map of Europe, for instance, would be more ‘useful’ if there were informational bubbles about specific countries, while several remarked that the orchestra mini-game could be improved with text that gave hints about the particular instruments users are asked to identify. Again, this largely anecdotal ‘data’ is of limited scope, but it is illustrative, we think, of the tendency – among school-aged children and educators alike – to recognize as ‘educational’ primarily those forms of knowledge most represented and mobilized in schools: text-based, propositionally-oriented ‘content’ [5, 6, 20].

5. LUDIC EPISTEMOLOGIES: LEARNING THROUGH PLAY

Jean Francois Lyotard and Marshall McLuhan, while writing from very different points of view and on different subject matters, both foresaw digital media bringing forth very different ways of knowing. For McLuhan, what those changes were would only become clear as we were “looking through a rearview mirror”, that is when we were further enough away from the change in medium to understand what changes it had wrought epistemologically and ethically [15]. On Lyotard’s view, the technological movement towards computerization brings about a corresponding shift in both the forms and the relative values of knowledge. Following a Marxist distinction between use value
and exchange value, Lyotard argues that what it is we know and how we come to know it is very different in the “postmodern condition” : knowledge that has worth in and of itself or, following Marx, knowledge that is produced in order to be consumed (e.g. knowledge that has ‘use value’) is less valued [13]. Instead, knowledge becomes something that is produced in order that it might be sold (“exchange value”), or in Lyotard’s words:

The relationships of the suppliers and users of knowledge to the knowledge they supply and use is now tending, and will increasingly tend, to assume the form already taken by the relationship of commodity producers and consumers to the commodities they produce and consume - that is, the form of value. Knowledge is and will be produced in order to be sold, it is and will be consumed in order to be valorized in a new production: in both cases, the goal is exchange. [13]

While we are perhaps not yet able to look in the rear-view mirror of online game media, or even Internet and game media in general, two important epistemological aspects that enabled us to communicate Baroque music content into the context of an online learning game are noteworthy: the possibility for interactivity – both conceptual and embodied, and the combination of visual and auditory modes of presentation – offering complementary, not redundant, understanding and experience. These two aspects present opportunities not possible in pedagogies built from other media, and have the added bonus of arriving nested in a context already popular with the intended wider (youth) audience.

Furthermore, the conceptual and interactional conventions already present in this context – that of digital games – becomes scaffolding for building an experience of learning that is already familiar and enjoyable. And while their merits as teaching tools have yet to be examined and/or evaluated, all three of the mini-games described above are, we believe, examples of creating a focused learning (as opposed to learning that games already provide; see [18]) of specific content – in our case Baroque music – which takes advantage of well-established design and game mechanics and conventions in order to cultivate new audiences for an rather esoteric cultural form, by exploiting the affordances of what is very much a ‘popular’, mass-cultural medium.

6. **LUDUS (latin): GAME, SPORT, SCHOOL...**

As has been argued numerous times [6, 16] formal education has, in recent decades and often through the deployment of digital technologies, wholly embraced this Lyotardian conception of education’s having instrumental, not intrinsic value, in its contemporary incarnation as a commodity to be exchanged: for marks, for credentials, for increased opportunities in a globalized ‘knowledge economy’. On this model, the classical notion of knowledge formation as in inherently beneficial, even pleasurable pursuit seems to have very little play - as evidenced by a public education system which, in recent decades in Canada, has made arts education almost obsolete in its move toward standardized testing and a return to “fundamentals.”

In our development of this small-scale Flash game, we have tried to invert this instrumentalist educational economy, by creating a learning resource which has little to no “exchange value” - distributed online for free, it is unauthorized by any formal curriculum, and disconnected from any official ‘credentials’.

By privileging embodied interactive play, and de-privileging propositional ‘information’, we have tried to design an experience which offers players opportunities to simply understand a certain genre of music better, and, we think, enjoy it more. Our game may in this way have little educational ‘exchange value’, but in learning from and borrow heavily upon the kinds of enactive learning accomplished through games like Guitar Hero, Elite Beat Agents, and DDR, we have sought educational value of a different, and indeed itself a ‘classical’ form: a form that retrieves and resuscitates the very old and very powerful connection between learning and pleasure, and between education and play – which continues to reside in the ‘intrinsically-motivating’ character [7, 19].

7. **ACKNOWLEDGEMENTS**

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8. **REFERENCES**


