

## შემეცნებითი კომპიუტერული პროგრამების შემუშავებისა და გამოფენებში გამოყენების საკითხისთვის

გოგონაია ირინა  
ბაგაური ნესტან  
მურუსიძე შორენა  
ხელნაწერთა ეროვნული ცენტრი

სტატიაში ხელნაწერთა ეროვნული ცენტრის გამოფენისა და განათლების დეპარტამენტის შემუშავებული სასწავლო შემეცნებითი კომპიუტერული პროგრამების პაკეტის „მე მიყვარს წიგნი“ მაგალითზე ნაჩვენებია გამოფენებში თანამედროვე ინფორმაციულ-საკომუნიკაციო ტექნოლოგიების გონივრული და მიზანმიმართული გამოყენება, რაც ეხმარება დამთვალიერებელს ექსპონატებთან რეალური კავშირის დამყარებასა და მათ კონცეპტუალურ გააზრებაში.

ამ პაკეტის ერთ-ერთ მოდულს წარმოადგენს სასწავლო შემეცნებით კომპიუტერულ პროგრამა ანიმაციის ელემენტებით “ხელნაწერი წიგნის შექმნა”.

სასწავლო-შემეცნებითი კომპიუტერული პროგრამის შემუშავებისათვის განისაზღვრა კომპიუტერული პროგრამის მიზნები და შინაარსი; შემუშავდა კომპიუტერული პროგრამის სცენარი; განისაზღვრა პროგრამული ფუნქციონალობა. პროგრამა სრულდება მიღებული ინფორმაციის შემაჯამებელი ინტერაქტივით.

კომპიუტერული თამაში შესრულებულია Adobe Flash CS 5 ტექნოლოგიების გამოყენებით, Actionscript 3.0 პროგრამირების პლატფორმის ინტეგრაციით. ტექსტი ქართულენოვანია და თავსებადია Unicode სტანდარტთან. თამაში თავსებადია შემდეგ პლატფორმებთან და ოპერაციულ სისტემებთან: Microsoft Windows XP, Microsoft Windows Vista, Microsoft Windows 7 (Starter, Home, Professional and Enterprise Editions).

კომპიუტერული პროგრამის განთავსება შესაძლებელია ვებგვერდზე და თავსებადია შემდეგ ვებ-ბრაუზერებთან: Internet Explorer, Firefox (Windows, Linux), Google Chrome (Windows), Opera (Windows, Linux) კომპიუტერული თამაშის ინტერფეისი და გრაფიკა შედგება ორგანზომილებიანი ანიმაციით.

აღნიშნული პროგრამა მიზნად ისახავს, ფართო აუდიტორიას გააცნოს ხელნაწერი წიგნის შექმნის ძირითადი ეტაპები და ჩართოს დამთვალიერებელი ამ მრავალფეროვან პროცესში სამეცნიერო-პოპულარული ტექსტების და ხელნაწერთა ეროვნულ ცენტრში დაცული საილუსტრაციო მასალის გამოყენებით.

## For The Issue Of Developing Cognitive Computer Programs And Using Them During Exhibitions

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Purposeful and creative utilization of modern information communication technology (ICT) in exhibitions aids the visitors in forming a real connection with artifacts and their conceptual realization (Piachente, 2009, p. 224). The limiting factor in integration of modern information communication technologies in the museum processes is the supply of various computer programs, and not technology (computer, audio and visual equipment).

Currently, there are no developed original or localized cognitive educational computer programs in Georgia, which could be used for promoting the cultural heritage.

Exhibition and Education department of National Center of Manuscripts created a package of educational cognitive computer programs for popularizing the unique and specific materials housed at the Center. The package consists of three modules. The first module is an educational cognitive computer program with the elements of animation "Creation of a Manuscript". This program aims at introducing main stages of manuscript creation to audience and involving it in this diverse process, via introducing popular scientific texts and visually attractive illustration material preserved at the Center.

For the purpose of developing the educational cognitive computer program "Creation of Manuscript" we set and implemented following goals:

1. We defined the goals and content of a computer program;
2. We developed the script for the computer program;
3. We defined the functionality of the program.

The program content reflects the process of manuscript creation by themes: skin and its treatment; tools for parchment treatment; writing tools; pen; ink; dye; preparing the page for writing, text division; capital letter; miniature; organizing the manuscript page; binding the manuscript; cover pages. Working out of the remarked themes were made on the basis of scientific works (Chumburidze Zurab, *Following the Georgian Manuscripts*, Tb., 2000; Karanadze Maia, *History of Cover of the Georgian Book*, Tb., 2002).

The program concludes with an interactive quiz, which includes three tests: about ink, manuscript structure and writing tools.

The program has a stimulating function – in case of a correct answer, the audience receives additional story about the manuscripts housed in the National Center of Manuscripts with a corresponding illustration as a reward. Via this interactive quiz, the audience can evaluate its knowledge.

It must be noted that the developing of this component is implemented according to the National Curriculum proved by the Ministry of Education

and Science for general education schools, based on the defined results according to the standard for the following subjects: Georgian language and literature (native tongue) and history (National Curriculum 20102011).

The project script of the computer program includes all texts that can be shown up on the screen, images, links related to the content, instructions etc. (The script of "Creation of Manuscript" is presented at the end of this article).

The technical component of the digital product was performed by "Innovative Systems Management" LTD.

The computer program is created by using Adobe Flash CS 5 technology, by integrating the platform of Actionscript 3.0 programming. Text is in Georgian and is compatible with Unicode standards. The program is compatible with the following platforms and operational systems: Microsoft Windows XP, Microsoft Windows Vista, Microsoft Windows 7 (Starter, Home, Professional and Enterprise Editions).

The computer program can be uploaded to websites and is compatible with following webbrowsers: Internet Explorer, Firefox (Windows, Linux), Google Chrome (Windows), Opera (Windows, Linux). Computer program interface and graphics is twodimensional animation.

A teachingcognitive interactive computer program "Creation of Manuscript", created by us, is included in the major exhibition project of National Center of Manuscripts "Georgian Manuscript" and is a practical example of effective utilization of computer technologies during exhibitions.

It must be noted that the program "Creation of a Manuscript" was utilized within the scope of a specific exhibition, as well as separately, as an independent educational resource in various projects by National Center of Manuscripts (excursion tour "Journey to the World of Manuscripts", 13<sup>th</sup> Tbilisi International Book Festival, International Day of Museum etc.)

The project script is presented below:

№	Description of the Shot	Text	Instruction	Animation
1.	On the left side of the screen - photo of manuscript - Gelati Four Gospel (XIIc.). On the right side of the screen - introduction text about Georgian manuscript book. On the right bottom side of the screen - place of preservation of Gelati Four Gospel.	Georgian Manuscript books have been created throughout the centuries. Manuscript book was created differently from the printed books and that was a very interesting process. Do you want to be introduced to this process? Preserved in the National Centre of Manuscripts.	Click on the manuscript page.	Image is twinkling.

№	Description of the Shot	Text	Instruction	Animation
2.	<p>On the left side of the screen - image of the calf.</p> <p>On the right side of the screen - text about the parchment.</p>	<p>In Georgia parchment or pergament was the most common material for writing that was made from calfskin, sheepskin or goatskin.</p>	<p>Click on the manuscript page.</p>	<p>Image is twinkling.</p>
3.	<p>On the left side of the screen – calfskin stretched on a frame. Special kind of scraper knife is shown next to the frame.</p> <p>On the right side of the screen - text about the processing of the skin.</p>	<p>The skin was soaked in the burnt lime water, then it was cleaned by a scraper knife and stretched on the special frame. Surface was polished with chalk, egg-core and other substances.</p>	<p>Click on the scraper knife and get involved in the processing of the skin.</p>	<p>Calfskin will be stretched on a special frame. Image of scraper knife is twinkling. According to the instruction, after giving the order, scraper knife begins processing of the skin, stretched on the frame.</p>
4.	<p>On the left side of the screen – processed, uneven shape of skin without frame. Rectangular shape of sheet inside the skin.</p> <p>On the right side of the screen - text</p>	<p>Parchment is ready. Give it the shape of the sheet.</p>	<p>Click on the parchment.</p>	<p>Rectangular shape of sheet appears inside the skin. Image is twinkling.  According to the instruction, after giving the order, sheet, opening in two pages, is cut out from the skin.</p>

№	Description of the Shot	Text	Instruction	Animation
5.	<p>On the left side of the screen - two pages of the opened book. With inscription: "Recto" and "Verso".</p> <p>On the right side of the screen - text.</p>	<p>By dividing one page of parchment in two parts, we get two sheets. Sheet has two sides: "Verso" and "Recto".</p>	<p>Do you want to continue creation of the book? Click on the parchment.</p>	<p>Image is twinkling.</p>
6.	<p>On the left side of the screen - writing tools. (full stop marking and ruler tools).</p> <p>On the right side of the screen - text.</p>	<p>Before beginning writing on the parchment, calligrapher was ruling the page with special tools beforehand and was preparing for dividing it equally and nicely.</p>	<p>Click on the writing tools.</p>	<p>Image is twinkling.</p>
7.	<p>On the left side of the screen - page of the parchment and writing tools.</p>		<p>Click on the writing tools.</p>	<p>Image is twinkling. According to the instruction, after giving the order, marking full stops and ruling on the parchment are made with writing equipment.</p>
8.	<p>On the left side of the screen - page of ruled parchment. On the right side of the screen - text.</p> <p>Link - bellow the basic text.</p>	<p>White stripe must be slightly reflected on the sheet. Do you know that full stops and lines marked by calligrapher are still reflected on some of the ancient manuscripts?</p>	<p>Click here and see the instruction of the link. Click the mouse here.</p>	<p>After the order corresponding to the first instruction, photo preserved in the national centre of manuscript appears in the shot.</p>

№	Description of the Shot	Text	Instruction	Animation
9.	<p>On the left side of the screen – page of the parchment, on the one side of it, on the right - reed pen, on the other side, on the left – ink and full stops marking and erasing tool.</p> <p>On the right side of the screen - text about ink.</p>	<p>Ink is a Greek word and it means "black". Old manuscripts were written with black ink. Ink was called only black liquid. Beginning of a new chapter, title and important places were written with a red ink, cinnabar, so called Singury. Valuable manuscripts were written with a gold mixed ink (gold ink), in which gold was involved.</p>	<p>Click on the reed pen and begin writing. Click here, if you want to know more about black ink (instruction of link).</p>	<p>Reed pen is twinkling. By clicking on the link, appears the text about preparation of ink. By clicking on the pen, it takes ink from the inkpot and begins writing. Spot remains on one place while writing. Marking-erasing tool erases the spot. Text, on the half page is written with black and red ink.</p>
10.	<p>On the left side of the screen – painting - inkpot and right hand of calligrapher with a reed pen in the process of writing.</p> <p>On the right side of the screen - text about a pen.</p>	<p>Kalami is the ancient Georgian name of writing tool. It was being made from the thin reed stem. It was cut shortly; nib was sharpened and splited in two parts. In this way the thin groove was being prepared for flowing the ink. In case of forcing on the nib the ink was flowing thickly from the enlarged groove. Later the reed pen was replaced by goose feathers. Its nib was being made by the same way. Pen was kept in the special pencil-box. Nowadays writing tools are made from the metal, but the name – Kalami - remains the same.</p>	Continuation	Image is twinkling.

№	Description of the Shot	Text	Instruction	Animation
11.	<p>On the left side of the screen - partly written page of the manuscript.</p> <p>On the right side of the screen - text.</p>	<p>In the making of manuscript, text was usually written first. Calligrapher was always leaving the special space for the drawing on the page of the book, during the writing. This manuscript drawing is called miniature. First of all illuminator was making outline, that was filled with the colored dyes. Illuminator was decorating manuscript page with ornaments and decoration.</p>	<p>Click here if you want to see how manuscript is illuminated</p>	
12.	<p>On the screen - manuscript page - text is at the top part of it and contour of miniature below.</p> <p>At the below part of screen - brush and vessel of dye.</p> <p>On the right side of the screen - text.</p>	<p>Illuminator was using natural dyes for painting the miniatures.</p>	<p>Click on the brush</p>	<p>Image is twinkling. After the order corresponding to the instruction brush takes dye from the vessel and begins coloring the miniature.</p> <p>Manuscript page enlarges on the screen</p>
13.	<p>On the left side of the screen - manuscript page.</p> <p>On the right side of the screen - text about the capital letter.</p>	<p>While writing manuscript books, calligrapher was making the capital letter bigger and especially illuminated at the beginning of every paragraph. This letter is called Capital letter. All capital letters used in the manuscripts were different from each other.</p>	<p>Click on the capital letter</p>	<p>Capital letter is twinkling. After the order corresponding to the first instruction, manuscript page disappears. The capital letter enlarges.</p>