Dokeos Videoconference

**Usability Evaluation
of the Pre-Version**

Report

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Dokeos Videoconference – Usability Evaluation

0 Executive Summary

In a heuristic walkthrough, the usability of the Dokeos videoconferencing tool in its first version was evaluated. Apart from a number of minor issues regarding icon intuitivity or wording, there were some more serious issues regarding the interaction with the whiteboard module and the collaboration between students. Further facilitation of the interaction in the whiteboard could be obtained by speed optimisation.

As the tool is being rewritten, this report serves as a guideline to consider in the next version of the Dokeos videoconferencing tool.

1 Methods

To evaluate the software, the method "Heuristic Walkthrough" was applied. It is a combination of an evaluation along common usability heuristics and going through the application along the major use cases. By this means, both issues infringing general usability guidelines ("micro usability") and problems regarding the interaction design and information architecture ("macro usability") can be identified.

For each problem, suggestions how to improve the usability are given. A priority estimate (high, medium, low, wishlist) indicates the importance to address the given problem. In chapter three, the suggestions are summarised without explanation which may be used as input for a task tracking system.

2 Results

2.1 Whiteboard

2.1.1 Toolbar

The toolbar is made up of a permanent part which show the main functionality, and a variable part which offers functionality depending on the previous selection.
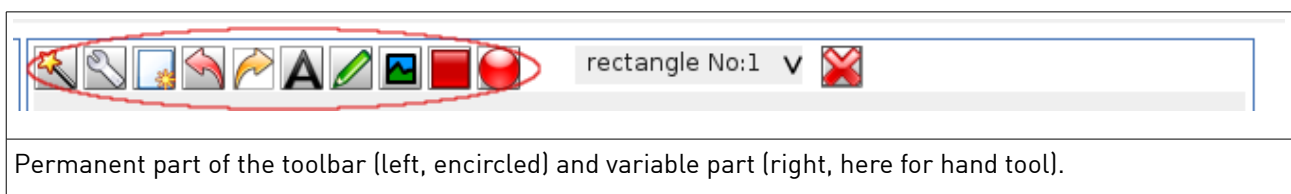
Permanent part of the toolbar (left, encircled) and variable part (right, here for hand tool).

In the permanent toolbar, general functionality, e.g. clear, undo and redo are mixed with pointer selection and paint tools. For a better overview, separators should be introduced and related functionality should be grouped.

Suggestions:

- High: Change the sequence in the permanent part of the toolbar and add separators ("|"):
  Clear | Undo - Redo | Hand/Pointer - Font - Paint - Rectangle - Ellipse – Image

- Wishlist: Consider moving the variable toolbar to a docker-like window that can be moved on the whiteboard. Like that, tools that offer a higher number of additional features (e.g. font tool) can be presented without space restrictions. Also, the interaction for retrospective editing becomes easier if it is decided to offer it in later versions (see 2.1.5 Retrospective Editing).

2.1.2 Tool Selection Feedback

The visual feedback which tool is currently selected is not sufficient. The button is pushed in when selected, but it moves back to the original position when the user clicks into the whiteboard. As well, the mouse cursor does not indicate the selected tool. The only indicator is a label in the status bar. Status bar information is easily overlooked.

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Push button feedback (top) and status bar feedback (bottom).
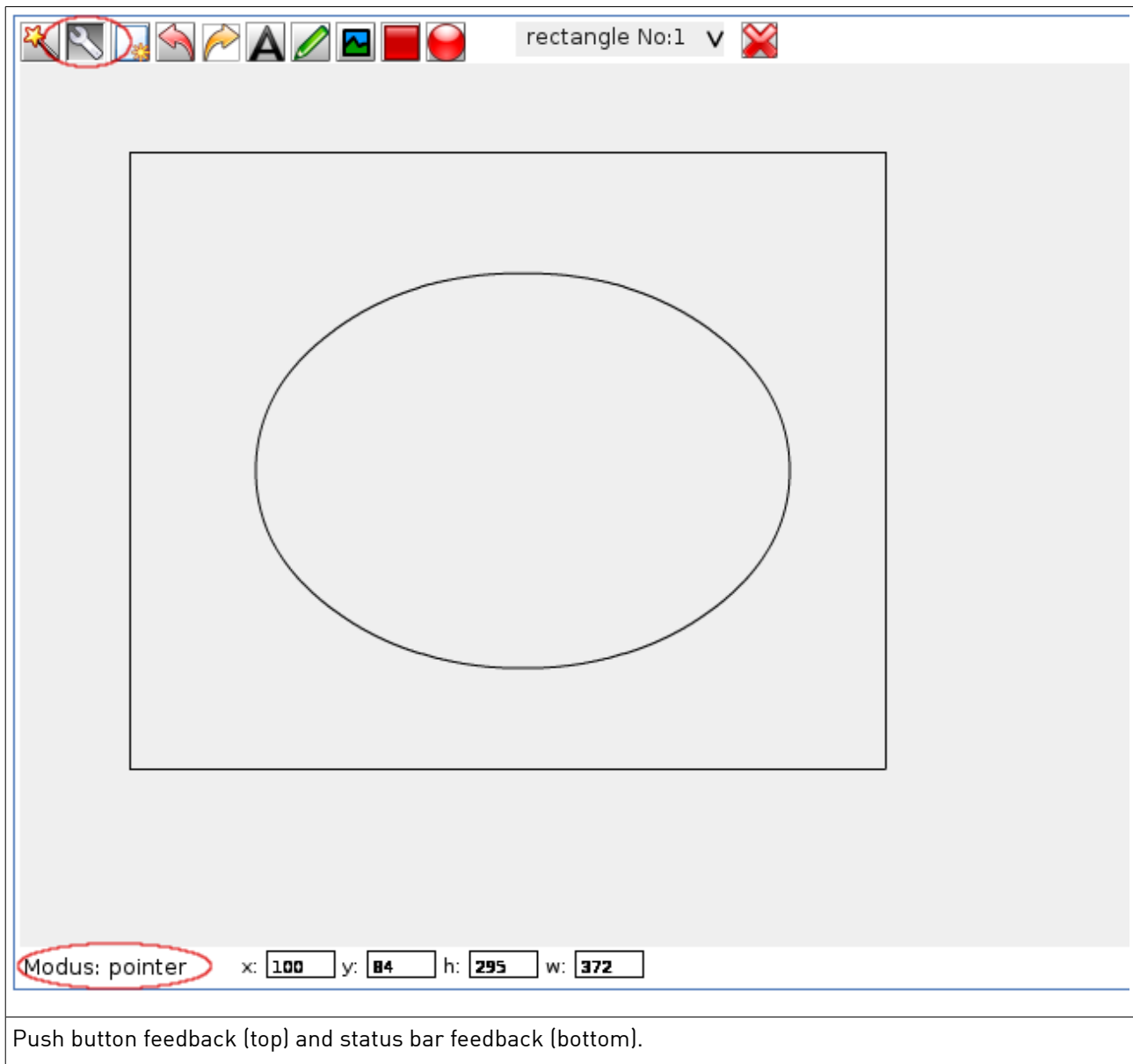
When the application is slow on responding, the user may trigger a number of unintentional drawing actions due to the missing visual feedback regarding the selected tool. This is a likely situation as the selection indicator is still drawn around an object when actually a paint tool is selected.

Suggestions:

- High: In the toolbar, clearly mark the current selection (leave the button pushed in).
- Low: If possible, add mouse pointer feedback.
- Low: In the status bar, omit the label "Mode" before the name of the tool and write it in capital letters.

2.1.3 Separation of Pointer and Hand

Currently, there are two different tools for dragging ("Hand") and editing or resizing ("Pointer"). When using the Hand tool to select an image, the application automatically switches to Pointer mode. Pointer mode includes the option to drag an object.
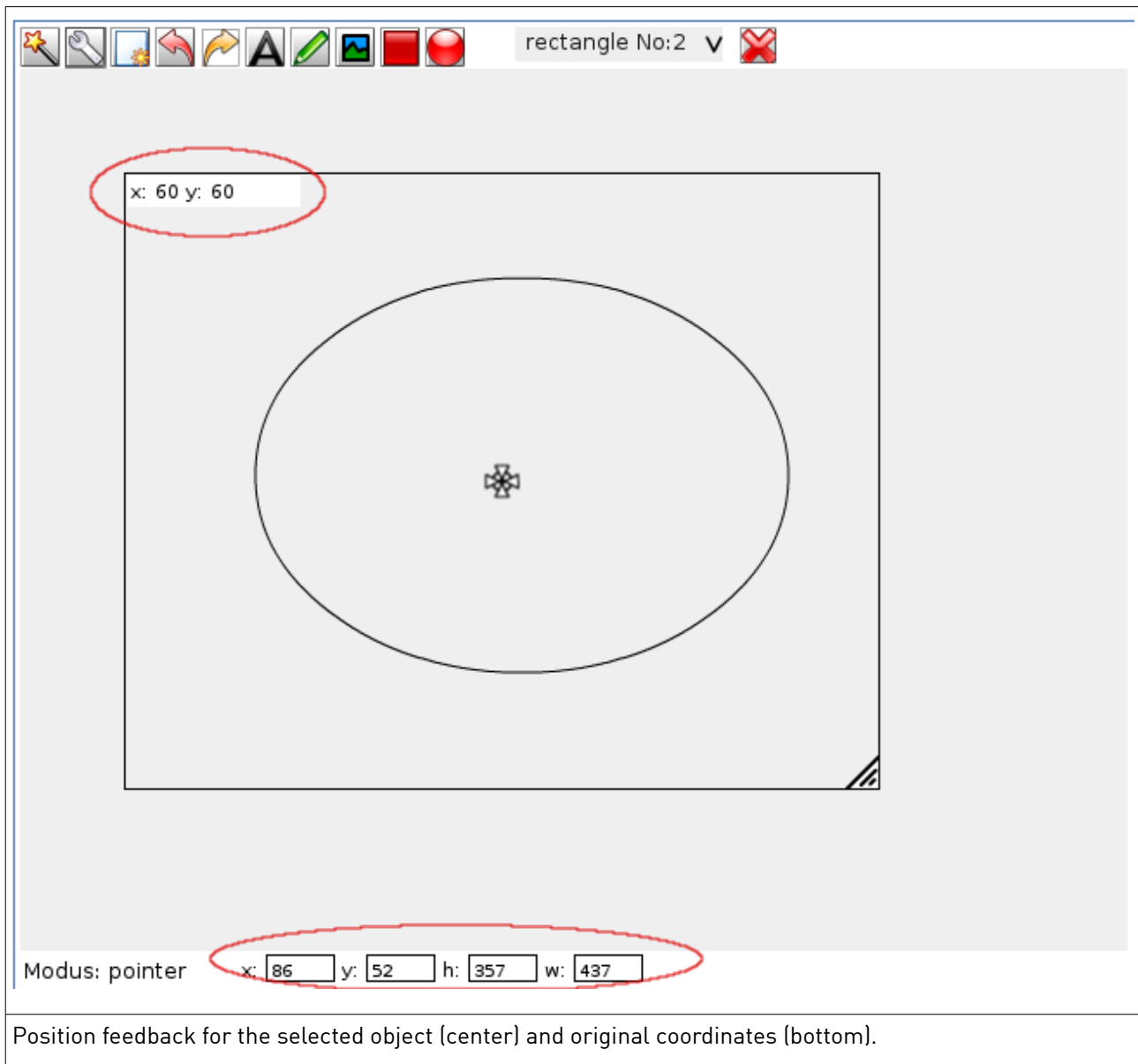
Suggestions:

- **High:** Unless there are compelling reasons against it, combine the functionality of Hand and Pointer in one tool (as currently the case for Pointer). This reduces the complexity of the toolbar.

2.1.4 Aligning along Coordinates

To support the user in laying out objects, the application shows the X and Y coordinates of an object in the status bar and in an overlay when it is selected. Especially for novice users, X and Y coordinates are more difficult to handle than for example a grid or rulers as they have to be aware of the overall size of the panel and remember X and Y values of multiple objects.

Additionally, the X and Y information in the status bar does not refresh when the object is moved. Even if this may be helpful to move the object back to the previous position, the inconsistency may be highly confusing especially to less experienced users.

Position feedback for the selected object (center) and original coordinates (bottom).

Suggestion:

- High: Update the X/Y information in the status bar while the object is moved.
- Medium: If possible, add visual indicators that help to align objects along a grid (e.g. ruler, grid lines). The x/y information in the overlay may then be omitted.

2.1.5 Retrospective Editing

Retrospective editing is strongly constrained. While resizing and moving positions is possible, neither text nor colour can be changed. It is a common use case that people start to draw or write text, then afterwards want to highlight it by changing the colour, realise that they misspelled a word etc. In the current implementation, the user either has to redraw the

object or find another work around.

Suggestion:

- High: Allow retrospective editing with regard to text editing for selected elements, (less relevant but desirable is colour).

2.1.6 Selection Tools

The two selection tools currently work inconsistently with the other tools. While the other tools allow for repeating an action (e.g. select font, write text, click to another area, write text again), repeated selection by clicking an object is not possible unless the user reactivates the toolbar button. Otherwise, the user has to select objects via the object selection drop-down menu. Due to the inconsistency with the other tools this behaviour is difficult to understand, especially when the application is slow on responding.

Also, there is currently no way to unselect an object and by that gain an overview over the whole whiteboard without selection indicators. This is especially problematic when numerous small text elements are added, because the selection indicator may cover the text.
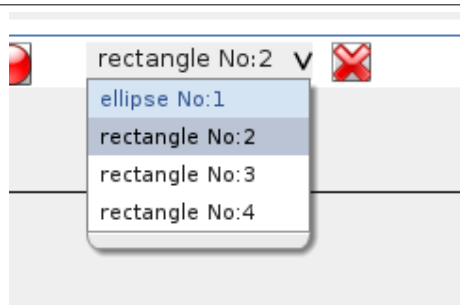
Object selection drop-down menu.

The drop-down menu itself is missing a label ("Objects"). Inside the menu, the objects are listed by their type and are assigned continuous numbers (e.g. "ellipse No:1"). When multiple objects of the same type are inserted, it may be difficult for the user to identify relevant objects in that list. This problem is enforced by the fact that deleted objects do not disappear from the drop-down.

For complex images, when multiple objects are positioned on top of each other, it is sometimes not clearly visible which object is selected. The user has to move the object to learn if it is the intended one. To undo these moves, the undo/redo function can not be used as moves are not part of the undo history.

In some use cases, multiple selection may be useful in order to drag a whole group of related items to another position. This may be especially required for brainstorming.

Suggestions:

- <mark>High:</mark> Allow repeated selection by clicking on objects. A click on whitespace should remove the selection indicator (select nothing).

- <mark>High:</mark> Illustrate the relation between menu entry and object on the whiteboard, e.g.

  - by adding a more distinct description ("Ellipses (yellow) No: 2", "Text (Agenda for…) No: 3"),

  - by adding tooltips with the item label to the objects in the area, so the user can reference them,

  - or by adding small object previews to the menu items.

- <mark>High:</mark> When an object is deleted, remove it from the menu.

- <mark>Medium:</mark> Consider to make moving objects part of the undo history.

- <mark>Low:</mark> Add the label "Objects:" for the object selection drop-down menu

- <mark>Wishlist:</mark> Consider to allow multiple selection in future versions.

2.1.7 Text Tool

When the user adds text to the whiteboard, an editor is opened. While the editor is open, the text cannot be moved around. As soon as it is closed, the text can not be edited any more. The user has to close the editor manually using a button on the top-right which strongly resembles the "Delete" button from the object selection menu. As described above, retrospective editing would facilitate the interaction with the whiteboard as the user may change text later on.

Text editor window (center) and font toolbar (color and font attributes, top right).
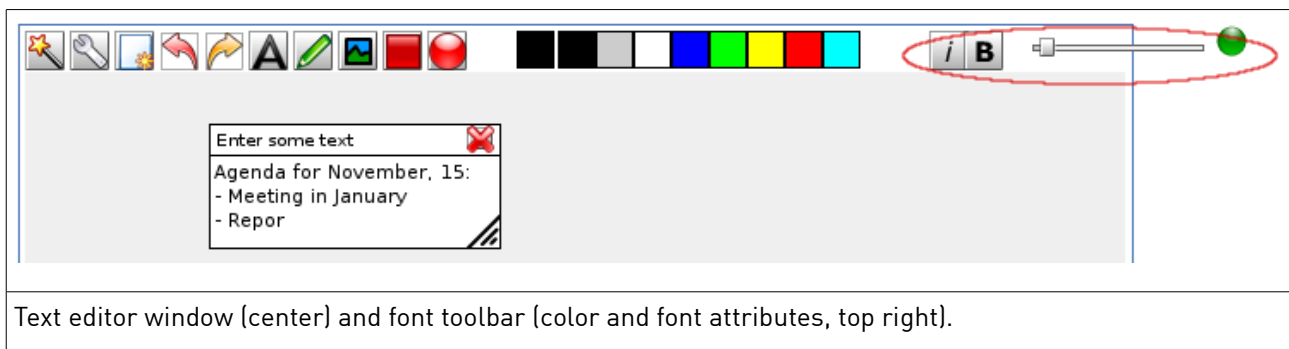
Also, the interaction when adding a text field may cause problems: When clicking onto the title bar of the text editor, a new text field is opened. Most likely, this is not the user's intention – rather, he tried to drag or close the first editor window. When closing the second one, the editor disappears, but still a (empty) text field is added to the object selection menu. This unnecessarily lengthens the object list.

The font toolbar provides options to set the font color and font attributes. It is broader than the overall page width. Also, the slider to manipulate the font size does not indicate the

current font size unless the user moves it. A status information should be given.

The slider itself is quite hard to navigate as a click onto a position does not move it, but dragging is required.

For the colour selection, there is almost no separation between current colour and colour palette.

Suggestions:

- High: Allow retrospective editing of text by reopening the editor for selected text fields when the user clicks the font tool. You may then close the editor automatically whenever the user clicks onto other objects or empty space.

- High: Empty text fields should automatically be removed from the object selection menu.

- Medium: Change the close item of the editor (e.g. do not use red colour).

- Medium: Consider to change the behaviour of the editor window:

    - a click on the title bar should not open a new editor window.

    - the title bar should allow dragging the editor window.

- Medium: When clearing the whiteboard, text editor windows should be removed even if not confirmed yet.

- Low: Add a label for font size (if possible due to space restrictions) and indicate the current size over the slider.

- Low: Change behaviour of the slider to "jump" to a position when it is clicked.

- Low: Decrease the distance between colours in the colour palette to one pixel to make the border to the currently selected colour more distinct.

- Low: Change the label to "Enter text" instead of "Enter some text"

- Wishlist: Consider moving the variable toolbar to a docker-like window that can be moved on the whiteboard.

2.1.8 Paint Tool

All in all, the speed of the application sometimes makes it hard to get immediate visual feedback on operations. This is especially the case for the paint tool.

As for the font tool, retrospective editing of colour or shape is not possible. Especially colour modifications might be useful.

The slider to change the line's pixel size is missing a label which makes it hard to understand its purpose in the first place. Also, the current pixel size is not indicated which may cause errors.

Suggestions:

- Medium: Allow retrospective editing of the line colour.

- <mark>Low:</mark> Add a label for pixel size (if possible due to space restrictions) and indicate the current size over the slider.
- <mark>Low:</mark> Change behaviour of the slider to "jump" to a position when it is clicked.
- <mark>Wishlist:</mark> Consider to add a way to draw straight lines, e.g. via a modifier key.

2.1.9 Image Tool

While adding images is possible from within the Image area, the image toolbar button does not seem to work.

2.1.10 Rectangle and Ellipse Tool

The behaviour of the rectangle and ellipse tool much resemble the paint tool. Refer to the paint tool's suggestions.

2.1.11 Saving the Result

Currently, the application does not provide an option to save the whiteboard contents. While users might create a screenshot and save it manually, an option to save it would be even more comfortabl.

Suggestions:

- <mark>Wishlist:</mark> Consider to add a save or logging option to future versions. It might be useful to save the whiteboard contents in the image area, so previous scribbles can be referred to later in a session.

2.1.12 Icons

In the current implementation, the icons for hand and pointer do not indicate their functionality at all. As well, the ellipse icon resembles a red led rather than a paint tool.
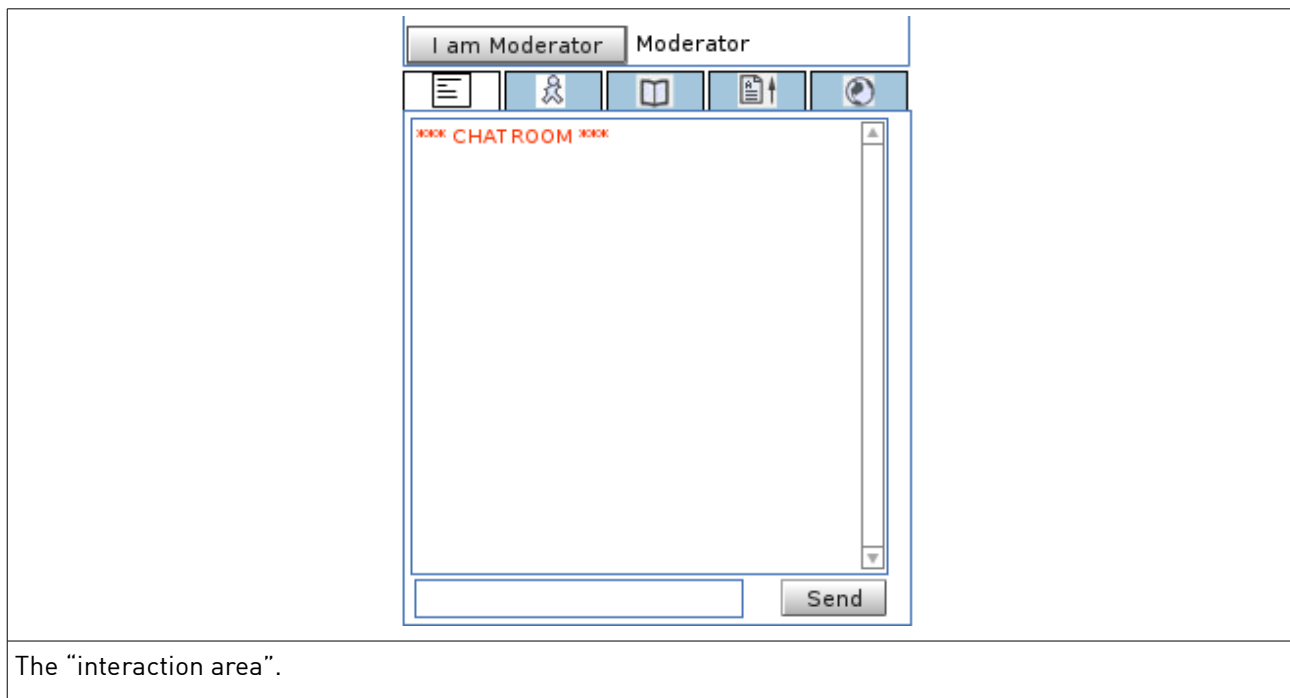
Suggestions:

- <mark>High:</mark> Use the default icons for pointer and rectangle/ellipse paint tools from the given icon set.

2.1.13 Interaction

To facilitate the interaction, a speed optimisation would be beneficial.

2.2 Interaction Area

The "interaction area".

2.2.1 Toolbar

In the interaction area offering chat, presentations, images and web browsing, the toolbar does not provide any tooltips. This makes it difficult to understand the functionality in the first place.

The icon style of this toolbar does not fit the other icons in the application. This is not severe, but affects the style.

Suggestions:

- High: Add tooltips to the toolbar.
- Low: Consider to use a consistent icon set for the whole application.

2.2.2 Moderator

Above the toolbar, there is an option to set yourself moderator. Neither state of the button nor the label next to the button (it is always the same) indicate if the user is actually moderator or not. It is unclear if the button has any effect.
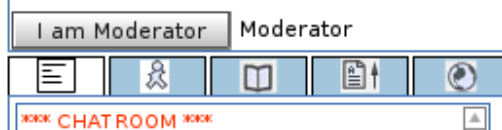
Moderator button.

However, it is questionable if users should be able to set themselves moderator, or if they should be assigned by the previous moderator to avoid conflicts (see 2.2.4 and 2.4.1).

Suggestions:

- <mark>High:</mark> If the current design is kept, use a checkbox with the label "Set me moderator" instead of the button.

2.2.3 Chat

In the current version of the software, chat comments are not identified by name but only by time. In real life conversations, it may be difficult to follow discussions.
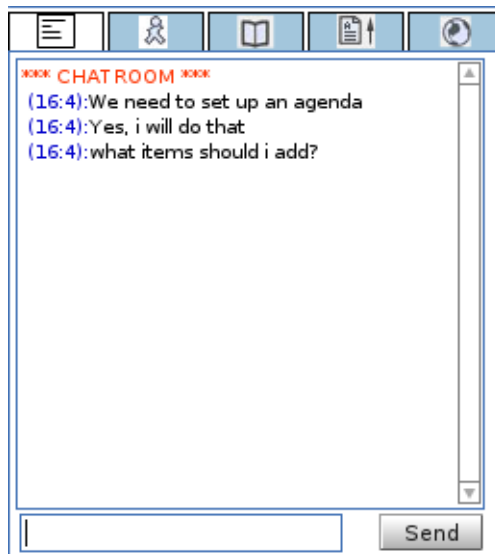
The chat area.

The chat history is deleted as soon as the user switches to another tab of the interaction area. This behaviour makes it difficult to use the other tools in a chat conversation, when video plus sound does not work by one reason or the other.

Typing and sending text is easy and intuitive. However, an option to save a log of the chat is missing as copy does not work in the chat window.

Suggestions:

- **High:** Add names to the chat comments.
- **High:** Keep the chat history during the whole session (that is until the user logs out or closes the browser window).
- **Medium:** Allow to copy the chat text, provide an option to save it or logs.

2.2.4 Contacts

In the current version, the contacts module does not seem to be implemented yet.

2.2.5 Presentations

In the presentation area, available presentations are listed, uploaded and can be converted to be added to the whiteboard. The latter functionality adds the presentation as images to the image area. At the moment, it does not yet seem to work properly (there is an error message showing up).
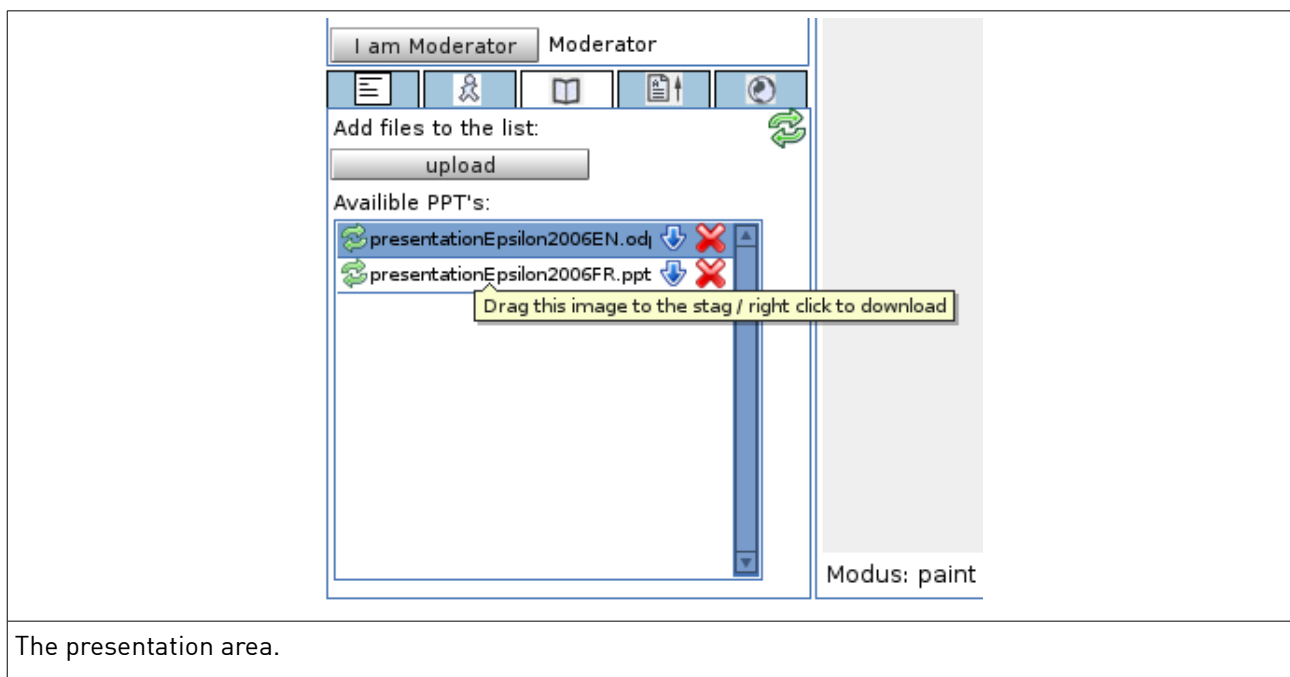
The presentation area.

In the interface, it is not sufficiently communicated that presentations are added to the image area. Neither the icon in the list of available presentations (it resembles "Refresh", left in the screenshot) nor the tooltip indicate that.

In the list of available presentations, there is a tooltip for each item saying "Drag this image to stag / right click to download". This text is confusing, as the user does not deal with

images but presentations, the notion "stag" is not used elsewhere in the application, and neither right-click nor dragging seem to work.

Above the list of available presentations, there is an upload button. Depending on where the presentations come from (from the dokeos workspace or if they need to be uploaded manually in the videoconference tool), this button is more or less important. As well, the need to upload a presentation might be less for students than for a teacher.

Currently, the delete function works without an additional confirmation. It is questionable if this is desired as unexperienced students might accidentally delete a file. Alternatively, only moderators might be offered the option to delete a file.

Suggestions:

- High: Change the tooltip for the conversion to "Convert this presentation to images and add it to the image list".
- High: Change the icon for converting a presentation from "Refresh" (which is used at other locations in the application) to a different icon, e.g. a simple arrow.
- Medium: Consider to move the upload button below the list of presentations. Change the label "Add presentation: [Upload]"
- Medium: Consider if non-moderators should be able to delete a file.
- Low: Instead of "Available PPT's", write "Available presentations".

2.2.6 Images

In the image area, there is a list of available images and converted presentations. Images can be dragged to the whiteboard, but there seems to be a problem to add more than one. If that is the case, there should be appropriate feedback.

Converted presentations are added as folders. To get back to the main list, the user has to click a button on top of the list. Novice users might have problems to find it there.

Suggestions:

- Medium: Consider to deactivate the up button when the user is in the parent folder, so it becomes more apparent in sub folders.
- Medium: Consider to move the upload button below the list of images. Change the label "Add image: [Upload]"
- Low: Change the label of the list of available images to "Drag images to the whiteboard".
- Low: Add a separation between action and information in the tooltip of converted presentations to "Click to open. Inserted: [date]".

2.2.7 Web Browser

The web browser opens a browser over the whiteboard. It is located below the toolbar, but still covers most parts of the drawing area. As the whiteboard's toolbar is still visible, users may assume that it is possible to paint in the browser – which is not. More likely, they may understand the undo/redo functionality as the browser's back and forward buttons. The URL bar is a bit hidden below the URL bar.

Suggestions:

- Medium: Consider to cover the whole whiteboard with the browser window to avoid confusion of toolbars and get more space for the web contents. Then, add a button to close the browser to the browser area in the interaction area ("Close browser").

- Medium: Add buttons to move back and forward to the browser's toolbar.

- Low: Change label "ReOpen browser" to "Open browser".

2.3 Video Tool

2.3.1 Set up

The set up of the video session is unproblematic, assuming that the system's video and sound gear has been set up properly before.

2.3.2 Scalability

The current design allows the display of up to four participants. It should be evaluated if this number is realistic in the given use scenarios, or if another presentation has to be chosen.

2.4 Collaboration Facilities

2.4.1 Moderation

In the current version of the software, there is a separation between moderator and other participants. The moderator's actions on the whitboard – including opening an image or a browser – are visible for the others, while their actions are not. At any given time, there is exactly one moderator in a videoconference. However, any other participant can take the moderator status from the current moderator by pressing the "I am Moderator" button.

While it makes sense that the action of only one person are visible at a time, the fact that everybody can take the moderator status from the other one may cause conflicts in less disciplined groups. Users may "steal" the focus from a moderator before he is finished.

Once a user became moderator, he can start to perform actions which are visible to others,

but there is no way to publish existing contents. For example, during the discussion, the user might have remembered a website he wants to show to the others. He opens the browser, enters the URL and navigates to the content, then gets the moderator flag – but the website is not shown to others unless he copies the URL, closes the browser, opens the browser again and re-enters the URL. Same accounts for painting or adding images – the user may be forced to repeat steps he already performed once he became the moderator.

Even more importantly, the user has no possibility to see how others see the difference between how others see the current whiteboard content versus himself.

Suggestions:

- Wishlist: Consider to change the way to assign moderation from "taking" to "giving" (e.g. last moderator passes it to the next person, e.g. via the webcam area).

- Wishlist: Consider to put public and own objects onto different "layers" which may be hidden. So the user can compare the own whiteboard contents with the ones the others see.

- Wishlist: Consider to add a "publish" function for selected objects on the own whiteboard as well as for the browser which is available in the interface of the current moderator only.

2.4.2 Paint Tool

Regarding collaboration during painting, and apart from the issue described above (missing ways to publish objects to others) it is problematic that a user who logged in later or experienced problems and had to login again is not shown the whole whiteboard contents, but only the objects to be added after his login.

Another collaboration issue is the fact that every user can edit, move and remove the own objects only. When a moderator adds an item to a mindmap, then gives the moderation over to another user who wants re-arrange the mindmap, he can only move the own objects, then has to give the moderator flag over to others and instruct them where to move their objects. This behaviour is time consuming.

Suggestions:

- High: When a new user logs in, always show him the current contents of the whiteboard.

- High: Always give the moderator full access to the "public" objects.

- Wishlist: Consider to add a "publish" function for selected objects on the own whiteboard which is available in the interface of the current moderator only.

2.4.3 Browser

For the browser, there is the same collaboration issue regarding missing ways to publish the existing browser view to others. Additionally, in the current version of the software, the browser publishes new sites only if they were manually added in the URL bar, it does not follow content links. At the same time, the URL is not refreshed in the URL bar, so there is no easy way for the moderator to show the others a content-linked site.

Suggestions:

- High: Follow the moderator's moves in a web site and publish each page.
- High: Update the URL bar to display the current URL.
- Wishlist: Consider to add a "publish" function for the browser which is available in the interface of the current moderator only.

3 Summary of Suggestions

3.1 Whiteboard

Toolbar:

- High: Change the sequence in the permanent part of the toolbar and add separators ("|"):
  Clear | Undo - Redo | Hand/Pointer - Font - Paint - Rectangle - Ellipse – Image
- Wishlist: Consider moving the variable toolbar to a docker-like window that can be moved on the whiteboard. Like that, tools that offer a higher number of additional features (e.g. font tool) can be presented without space restrictions. Also, the interaction for retrospective editing becomes easier if it is decided to offer it in later versions (see 2.1.5 Retrospective Editing).

Tool Selection Feedback:

- High: In the toolbar, clearly mark the current selection (leave the button pushed in).
- Low: If possible, add mouse pointer feedback.
- Low: In the status bar, omit the label "Mode" before the name of the tool and write it in capital letters.

Separation of Pointer and Hand:

- High: Unless there are compelling reasons against it, combine the functionality of Hand and Pointer in one tool (as currently the case for Pointer). This reduces the complexity of the toolbar.

Aligning along Coordinates:

- High: Update the X/Y information in the status bar while the object is moved.
- Medium: If possible, add visual indicators that help to align objects along a grid (e.g.

ruler, grid lines). The x/y information in the overlay may then be omitted.

Retrospective Editing:

- **High:** Allow retrospective editing with regard to text editing for selected elements, (less relevant but desirable is colour).

Selection Tools:

- **High:** Allow repeated selection by clicking on objects. A click on whitespace should remove the selection indicator (select nothing).
- **High:** Illustrate the relation between menu entry and object on the whiteboard, e.g.
  - by adding a more distinct description ("Ellipses (yellow) No: 2", "Text (Agenda for...) No: 3"),
  - by adding tooltips with the item label to the objects in the area, so the user can reference them,
  - or by adding small object previews to the menu items.
- **High:** When an object is deleted, remove it from the menu.
- **Medium:** Consider to make moving objects part of the undo history.
- **Low:** Add the label "Objects:" for the object selection drop-down menu
- **Wishlist:** Consider to allow multiple selection in future versions.

Text Tool:

- **High:** Allow retrospective editing of text by reopening the editor for selected text fields when the user clicks the font tool. You may then close the editor automatically whenever the user clicks onto other objects or empty space.
- **High:** Empty text fields should automatically be removed from the object selection menu.
- **Medium:** Change the close item of the editor (e.g. do not use red colour).
- **Medium:** Consider to change the behaviour of the editor window:
  - a click on the title bar should not open a new editor window.
  - the title bar should allow dragging the editor window.
- **Medium:** When clearing the whiteboard, text editor windows should be removed even if not confirmed yet.
- **Low:** Add a label for font size (if possible due to space restrictions) and indicate the current size over the slider.
- **Low:** Change behaviour of the slider to "jump" to a position when it is clicked.
- **Low:** Decrease the distance between colours in the colour palette to one pixel to make the border to the currently selected colour more distinct.
- **Low:** Change the label to "Enter text" instead of "Enter some text"

- Wishlist: Consider moving the variable toolbar to a docker-like window that can be moved on the whiteboard.

Paint Tool:

- Medium: Allow retrospective editing of the line colour.
- Low: Add a label for pixel size (if possible due to space restrictions) and indicate the current size over the slider.
- Low: Change behaviour of the slider to "jump" to a position when it is clicked.
- Wishlist: Consider to add a way to draw straight lines, e.g. via a modifier key.

Saving the Result:

- Wishlist: Consider to add a save or logging option to future versions. It might be useful to save the whiteboard contents in the image area, so previous scribbles can be referred to later in a session.

Icons:

- High: Use the default icons for pointer and rectangle/ellipse paint tools from the given icon set.

3.2 Interaction Area

Toolbar:

- High: Add tooltips to the toolbar.
- Low: Consider to use a consistent icon set for the whole application.

Moderator:

- High: If the current design is kept, use a checkbox with the label "Set me moderator" instead of the button.

Chat:

- High: Add names to the chat comments.
- High: Keep the chat history during the whole session (that is until the user logs out or closes the browser window).
- Medium: Allow to copy the chat text, provide an option to save it or logs.

Presentations:

- High: Change the tooltip for the conversion to "Convert this presentation to images and add it to the image list".
- High: Change the icon for converting a presentation from "Refresh" (which is used at other locations in the application) to a different icon, e.g. a simple arrow.
- Medium: Consider to move the upload button below the list of presentations. Change the label "Add presentation: [Upload]"

- Medium: Consider if non-moderators should be able to delete a file.
- Low: Instead of "Available PPT's", write "Available presentations".

Images:

- Medium: Consider to deactivate the up button when the user is in the parent folder, so it becomes more apparent in sub folders.
- Medium: Consider to move the upload button below the list of images. Change the label "Add image: [Upload]"
- Low: Change the label of the list of available images to "Drag images to the whiteboard".
- Low: Add a separation between action and information in the tooltip of converted presentations to "Click to open. Inserted: [date]".

Web Browser:

- Medium: Consider to cover the whole whiteboard with the browser window to avoid confusion of toolbars and get more space for the web contents. Then, add a button to close the browser to the browser area in the interaction area ("Close browser").
- Medium: Add buttons to move back and forward to the browser's toolbar.
- Low: Change label "ReOpen browser" to "Open browser".

2.4 Collaboration Facilities

Moderation:

- Wishlist: Consider to change the way to assign moderation from "taking" to "giving" (e.g. last moderator passes it to the next person, e.g. via the webcam area).
- Wishlist: Consider to put public and own objects onto different "layers" which may be hidden. So the user can compare the own whiteboard contents with the ones the others see.
- Wishlist: Consider to add a "publish" function for selected objects on the own whiteboard as well as for the browser which is available in the interface of the current moderator only.

Paint Tool:

- High: When a new user logs in, always show him the current contents of the whiteboard.
- High: Always give the moderator full access to the "public" objects.
- Wishlist: Consider to add a "publish" function for selected objects on the own whiteboard which is available in the interface of the current moderator only.

Browser:

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- High: Follow the moderator's moves in a web site and publish each page.

- High: Update the URL bar to display the current URL.

- Wishlist: Consider to add a "publish" function for the browser which is available in the interface of the current moderator only.