**MS WINDOWS PRODUCTIVITY RESEARCH APPLIED TO THEATRE**

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# ABSTRACT

 This work begins interdisciplinary, theoretical support for a new technical age of more creative and varied play writing and more productive theatre performance.

 I summarize past, highly validated display theory that is applied in an "interdisciplinary experiment" as technical additions to a professionally, table read, full length play showing justification of the application. Results suggest further interdisciplinary research to take advantage of demonstrated benefits and address interesting problems uncovered. In contrast to much theatre today that stems from past elocution, realism and illusion ages, presently being added are technical elements reinforcing live action and dialogue including projection. Projection had to wait half a century from attempts by Tennessee Williams to introduce it in "The Glass Menagerie." I take this technical addition a step further by projecting an MS Word script with color and embedded sound and images that come with productivity and "viewability" increases traded off with increased pre-performance costs. The article defines these and following constructs. Play writing, performance and audience enjoyment can be greatly enhanced using script projection with embedded technical elements, and I present a needed, better, theoretical approach to play writing supporting this technical addition.

 I summarize a Social Science experiment resulting in my former, original display theory, involving Viewability, Complexity, Productivity and MS Windows. That theory is expanded and applied to both play script "pages" in one or more MS Windows and to Proscenium Theatre Production. See papers discussing that experiment presented and published through ISSS in the '90's. I consider projection of a digital script, with embedded multi-media that is played/displayed by the projectionist, as one or more additional "virtual" cast members along with traditional non-human theatre elements. Practical considerations of script projection suggest beneficial changes in the "standard" script format. Original contributions to display theory for playwrights and theatre performance follow from summary and analysis of the results of readings of the experimental play, "Con Te Partiro," in December, 2016. Using the new theory promises very much greater opportunity for variety and creativity to the playwright and audience. MS Word is more powerful and flexible compared to existing play writing Apps. This resulting theory is applied to the script, projected image and proscenium as analogues of Windows.

 Points in the theory are correlated with results--validating them as appropriate applications of the prior social sciences experimental results--suggesting a different script format and an architecture for play writing (in development). Lessons learned in the table readings suggest improvements that might be made by Microsoft to Word. Interdisciplinary research opportunities to substantiate other points in the new theory are listed.

 This paper lays a guiding, validated, scientific foundation for a new, theoretical architecture of more creative and varied play scripts in a technical, interdisciplinary age of theatre, promising cost savings at performance time.

Keywords: Productivity in Theatre, Virtual Dramatis Personae, Theory of Theatre, Information Technology in Theatre, Multidisciplinary Contributions to Theatre

# CONTEXT

**MS Windows, Viewability Theory Summary, and Theatre as Display**

As previously shown (Buckner 1992), making information viewable in Microsoft Windows may be subsumed under the more general activity of display. Examples of display are posters, marquee listings, television, cinema, printed material, and photographic prints. Microsoft promoted Windows as a tool to increase productivity. In a social sciences experiment, I defined productivity as: 1) efficiency (the time rate of work accomplishment), 2) effectiveness (how well the work is accomplished, and 3) motivation (to do the work). I coined a new construct, "viewability," as a composite of a) having all information needed to complete a task displayed, b) minimizing display of all extraneous information (distractions), and c) displaying the required information for the time needed to complete the task. I looked at productivity, viewability and perceived complexity as the number of Windows simultaneously displayed on a computer monitor were increased (independent variable).

Research showed that the above three components of viewability appeared together frequently in association with productivity increases involving display. The experiment showed with orders of magnitude below the nominal p=.1 (random effects influenced dependent variables < 10% of the time as opposed to effects of the independent variable)

, that multiple windows could not increase productivity factors 1) and 2) above because they increased complexity, but that they did increase 3) some because of the "gee whiz" factor. Viewability sometimes provided a binary "ability to accomplish a task as opposed to not being able to" such as a quality engineer having to track multiple displays of information about a product to establish its quality.

A live theatre performance may also be considered as display; the cast displays the information in the script to the audience. The proscenium is an analogue to a Window as is a page of script. Motivation [3)] is also important in theatre as it is desirable to have the maximum emotional effect upon the audience, and the goal of the production company is to dramatize the script within the budget [1)] as effectively [2)] as possible. Productivity for the theatre may be redefined to include efficiency [3)] as the benefit per dollar cost. This definition should be tested--a further research opportunity.

**TOWARD AN INTERDISCIPLINARY DISPLAY THEORY**

Originally, "display" of Object Linking and Embedding (OLE, a resource of MS Word in which objects such as .JEP images, .MP3 music files, etc. can be embedded in documents [via links] required responding to a pop-up window that warned of possible virus content in the object and asked if one wanted to proceed and a second that asked if one wanted that window to always pop up. Those windows violated b) above and were very distracting. I successfully got Microsoft to provide an option to suppress them. That action constituted computer science aiding the theatre--and was therefore interdisciplinary. Adding more technical aspects to the theatre (from electrical, electronic, mechanical and sound engineering) is interdisciplinary.

**Introducing New Technical Aspects to Drama**

Traditional non-human (not actors) aspects of drama have included the stage, curtain, lighting, sound, scenery, props and costumes. Bertolt Brecht unmasked the electrics (pipes that hold lighting equipment over and in front of the stage) and sound equipment, considered "technicals." Emphasis is now being placed, for grant writing for theatre, upon the addition of more technical aspects. Interdisciplinary research involving theatre opens such opportunities for grants to the other disciplines involved. Tennessee Williams wanted projection of titles by "magic" lanterns in "The Glass Menagerie" in the '40's but the theatre industry resisted it for decades; the play had a successful run on Broadway without it. Academic theatre programs began teaching projection in the first decade of this millennium and "War Horse" and "Shen Yun" use it creatively and effectively. Moving projectors are almost a must in rock concerts and are now a common part of stage performances as are lasers and fog machines. My innovation is to project a digital, multi-media script. The screen may be considered an additional "Window" used to display the script. Windows-display theory might predict that adding the projection screen window to the proscenium increases complexity.

Action is important in theatre and adds to the display; action is more important than the dialogue because it is visual (Boal 1974). Deaf people adapt well if they can see but blind people are more at a disadvantage even though they can hear. An icon is shown in the place in the script where an OLE link is inserted. The icon is inserted in the form of a picture with the title of the file name where the picture came from included underneath.

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Figure 1. An Icon for an Embedded File

By double clicking on the icon, the sound may be played or the image shown. Such a script constitutes a new literary genre where the reader may see/hear elements of an intended stage performance as opposed to only the printed page. The sound may be an effect, music, Morse code, etc. The image may be a still, a video, a slide show, etc. Both the clicking of the icon and music, sound effects, videos and slide shows "being displayed" are not static and add action. Projection of the script may be accomplished by hooking up a computer to the projector and scrolling the pages up in synchronization with the action on stage, and that is additional action. Projection of a digital script with active OLE therefore adds greatly to the action of a play and enhances motivation and effectiveness. Its added viewability aids the deaf. At performance time it also enhances efficiency in that, if used to augment the cast (not hire additional actors) it saves money. There are other reasons to project a script: because "it can be done,", to include the deaf, to reinforce actor parts, to separate parts (Boal 1974), and add to team building, to highlight main ideas (as in William's titles) as will be discussed in a new theory of playwriting being developed, to provide additional Brechtian qualities, to allow the audience to see a line that was missed, to provide additional "coolness" (McLuhan 1964) and to provide variety and creative opportunities to the playwright and theatre audiences. Windows-display theory suggests that such projection increases viewability at performance time.

**Virtual Cast Members**

Non-human elements of a theatre space have already been discussed. I reclassify them as non-human or "virtual" members of the cast and justification of this move is given below. Additional virtual cast members are afforded by the projected digital multi-media script. The cast, therefore, consists of actors and virtual cast members. In other words, the construct, "cast," subsumes actors and virtual, non-human theatre space elements. Allowing the playwright to write for this new "cast" suggests creation of an architecture that facilitates thinking in a new way (in terms of abstract ideas) at play script creation. This is fallow ground for new research.

**Lessons Learned from a Professional Table Reading with Projection of a Digital, Multi-Media Play Script**

In December, 2016, I had two table readings performed by paid professional actors in West Hollywood and Thousand Oaks, California, using two different stage settings and projectors, of a full length play, "Con Te Partiro." The play was written to illustrate increases in productivity applying the above Windows-display-viewability theory. Details will be provided upon request. The main theme of the play was recovery from trauma, partial complex grief and partial emotional dissociation following a tragic death. It was dedicated to the victims and their families of the San Bernardino terrorist shootings. The script was written to emphasize the positive and negative emotions experienced in grief recovery and to provide a cafeteria-style menu of effective self-help tips in the public domain.

Although no overwhelming problems were encountered with a digital, embedded multi-media script displayed on a computer monitor, difficulties were encountered with live reading and projection. Casting was flawed because actors chosen failed to act as a team allowing character separation and reinforcement from the projected script. Direction and rehearsal failed to achieve the intended "choreography" (Golden 2016) between action and dialogue and the initiation of OLE sound effects, music and images. I attempted to video and tape the readings to promote stage readings and full performances, but at performance (reading) time, the actors refused to stay in a group framed by the "window" of the camera viewfinders. I intended that the dialogue be fairly rapid to offset the dreariness of the death theme, but some insisted on their slow, "dramatic" interpretation. Cutting the length of the play between readings only increased the time that the reading took because of the resultant unfamiliarity with the slightly revised script. There were technical problems (the slider volume control of the PC audio signal input to the audio amplifier was corroded, requiring frequent, slight adjustment to prevent large variations in loudness) with the sound during the second reading and the stand-in assigned to help failed to show up. Changes in the MS operating system and/or Word application resulted in undesirable jumps to the top of the next page when scrolling near the bottom of each script page. Computer Science could again come to the aid of theatre by eliminating the bottoms of pages in projected multi-page play scripts. Of course, a post mortem was attempted--resulting in this paper and pointing toward a new theory of play writing architecture. In other words, the additional projection window increased complexity at the expense of productivity in the pre-production phases, as predicted. With proper casting, rehearsal (including technical) and direction, the extra viewability might increase productivity, with 1) and a) as redefined above, at the performance stage. A successful proof of concept was script projection involving some script formatting changes. Experience with submitting such scripts to the Association of Los Angeles Playwrights resulted in great resistance to these changes. Research to address these problems is indicated.

**Desirable Script Formatting Changes**

A "standard" play script format is dictated by many theatres as defined by the modern format suggested by the Dramatist's Guild. Roughly, page margins are one inch on each edge except for the left side, where 1.5" is allowed for three hole punching. However a projected script is not punched for binding and 1" on the left allows more room as per 1) above. Also, if the script is printed, it may be duplex printed without changing the side for punching.

Ergonomic considerations, in industries involving human interactions with computers and other equipment, suggest that if the eye can follow the center of the page down throughout the script, productivity can be increased by 1). The Dramatists Guild (DG) standard is that dialogue begins at the left margin, character names are centered between margins, action begins to the left of character names and stage direction begins at the centre between margins. The projection screen for small to medium sized theatres might be an 8' x 8' screen and with the DG format, the eye would have to jump around on it as well as on the stage (a three ring circus effect as mentioned in a scenario by (Boal 1974). A dialogue line might contain only a "No" or an expletive displayed on the far left; the next line might go margin to margin. I suggest that everything except stage direction be centered and that the exception be left justified. I included suggested left justified production cues to satisfy a) for those interested. I found that, depending upon the projector, with computer magnification of the font size by 160-210%, the centered parts of the script could be focused and were readable from the back of the rooms on a 8' wide screen. The reformatted stage direction and projection cues "ran off" of the screen to either side in accordance to b) above. (Further satisfaction of b) for those not interested could be "graying out" of the font color.) Use of color, not only in images, but also to highlight text for narration (and other uses), afforded by MS Word was very useful and productive. Determining the "best" format for projection might be a good area of research.

**More Interdisciplinary Aspects**

The DG format for musicals requires insertion in the script both the scores and lyrics of music; but using OLE, only an icon (with a file name) is required--resulting in shorter scripts and the ability to actually hear the music. (For the deaf, the lyrics could be projected on a separate screen or interpreted in ASL). Because music can be so intimately integrated into the script and the performance, it is an interdisciplinary aspect of this paper. One of the main drawbacks of using a word processor for script writing is repagination after changes; this is a computer science problem, and how best to do it is an interesting research opportunity.

**SUMMARY**

Scientifically tested and highly validated Windows-display-viewability theory is applied to play script pages to be projected with technical multi-media objects embedded. An increase of one projection window reduced productivity at pre-performance for a script written in that way, but should increase viewability (and productivity) at performance when rehearsals are done. Increased action in the projection window should result in lower performance costs by 1) and more audience motivation by 3).

I suggest that all non-human aspects of the theatre space be renamed "virtual characters"--a higher order idea of the "cast". This in turn suggests an idea-based architecture utilizing this change. A literary genre using a digital, multi-media script seems valid because it uses only one computer monitor screen "window" and is therefore not more complex--validating applying the Windows productivity research to play scripts. Format changes for script projection seemed to increase productivity. Gaining acceptance of format changes will probably be challenging. I suggest a theory and architecture of play-script writing incorporating the above changes (in development).

Abundant areas of interdisciplinary research were noted during the above mentioned professional table readings. A projected script with embedded multimedia promises a variety of new scripts and increased creativity for the playwright and audiences, and productive utilization of MS Word in lieu of script writing apps with appropriate changes.

This author is open to cooperation in future research and publication.

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