The Omnipresent Android Device and Political Science Teaching Methods

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The political science classroom, in 2016, has Android devices in the hands of almost all students who attend classes. The computing strengths of these smartphones and tablets have authentic potential for instructional innovation. Realizing the classroom gain that might occur confronts substantial difficulties, however. Classroom devices include a mixture of various versions of Android. Everything from Android 4.0 to Android 6.0 provides the OS for student smartphones and tablets. The differences in the performance capabilities of these various versions of Android is great. Confusion exists about what Android is because these differences in performance ability are meaningful.

Implementing ideas for classroom support for Android instruction may face difficulties. ICT implementation has seen famous cases where best ideas for technology have failed to gain popular support. Possibly, anti-competitive allegations about Google have a negative influence on implementation of Android for the classroom. Implementing Android ideas may not be effortless, but the incentives for accomplishing these ideas are substantial.

Android is useful in word processing, learning statistical concepts, and accomplishing statistical analysis. The perceived need for better ICT in all these educational objectives is great. The friendly, ever-present Android device could accomplish much in improved instructional techniques in these areas. Reasonably, improve student performance could be anticipated were more use made of Android to attain these educational objectives. Beyond this, Android's ability to support Chromecast and Miracast is the best instructional projection system that now exists. Anything that appears on a smartphone or tablet screen can be seen on the classroom television presentation system. Everything from Netflix to a demonstration of a statistical app can readily be presented to the classroom.

The usefulness of encouraging more use of Android in developing student computer literacy has been presented as significant. The increasing sophistication of each version of Android recommends this OS as a valuable learning tool in developing ICT strengths. Positive developments in data presentation, editing, security, and knowledge presentation all convince of Android's potential in improving student computer abilities. Plans for the next version of Android include emphasis on virtual reality. The possibilities for virtual reality in the classroom are many including helping students learn about political institutions and the political process.
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Android innovations are allowing more computing strength in the hands of political science students with each development. With Android, students are able to accomplish approximately the same computing as with traditional Windows computers. Android apps make possible word processing, calculations, spreadsheet analysis, various mapping applications, and statistical analysis. Sharing features found on Android devices can allow many possibilities for collaborative classroom ICT. The possibilities for educational use of Android devices have not been adequately understood. This paper intends to examine the many possibilities Android devices offer political science instruction. The current development and potential possibilities of Android acknowledges an increasing computer capability available to students that could positively affect political science teaching.

When one looks out over a political science classroom, an astounding number of Android devices can often be observed. Frequently, the strange admixture of different smartphones and a few tablets is seen as having a nuisance potential. Instructors are notoriously unfriendly towards students who insist on using their smartphones in the classroom. Instead of looking at these numerous Android devices as potentially mischievous, the political science instructor needs to perceive the potential educational significance of the computing strength his students have brought into the classroom. Both inherent features of the Android operating system and various apps can convert all this ICT equipment into something useful to political science education.
Now, utilizing Android smartphones and tablets for political science education purposes is not all that simple. There is a dazzling amount of dissimilarity among all those smartphones and tablets the instructor confronts. Only a few devices found in the classroom with students have a Windows operating system. Predominantly, smartphones and tablets work with the Android operating system. The competition in operating systems that Microsoft had long opposed has become a reality with Android. Differences between the Windows operating system and the Android operating system are significant. The implications of this competition between Windows and Android can be usefully understood. There are many computing possibilities now available to nearly everyone that had formerly been significantly restricted by the Windows OS. ICT’s ability to be a significant factor in political science education is becoming greater as a result of the development of Android OS.

Development of Android has happened with a confusing number of different versions. With names like Donut (Android 1.6), Eclaire (Android 2.1), Froyo (Android 2.2), Gingerbread (Android 2.3), Honeycomb (Android 3.0), Ice Cream Sandwich (Android 4.0), Jelly Bean (Android 4.1), Kit Kat (Android 4.4), Lollipop (Android 5.0), and Marshmallow (Android 6.0) each version has increased in sophistication and usefulness. Visiting eBay, informs that all Android versions from Ice Cream Sandwich (Android 4.0) to Marshmallow (Android 6.0) are being offered to the public, presently. A person purchasing a tablet online has to be ICT savvy if they are to avoid purchasing one of the less sophisticated earlier versions of the Android OS.
The computing strength of the more advanced Android versions evidences significantly more ICT ability. Production of Android tablets has been such that an astounding number of the various Android 4 devices were produced. Now, the price of Android 4's has been driven low by subsequent versions of the OS on tablets. Differences in computing capabilities among the various Android versions has contributed significantly to misunderstandings about the potential of the OS.

**Resolving Misunderstandings about What Android Is with Students**

College political science students have grown up with Windows. Microsoft has promoted the company's Windows operating system on desktop and laptop computers for over three decades. Windows 95, Windows 98, Millennium, XP, Vista, Windows 7, Windows 8, and Windows 10 have evidenced significant developments in the computer's capacity to do useful tasks. The orderliness with which Microsoft has developed Windows OS has made the personal computer a basic tool in almost all households. Almost all college students have literacy that enables them to use Windows OS successfully accomplishing numerous productive activities associated with being competent students.

Android, on the other hand, does not have the clear product definition that Windows has. While almost everyone has a smartphone, how these devices work is not well understood. IPhones, Blackberries, and Android devices all have contended for the smartphone market.
Recently, IOS and Android appear to have won out causing smartphone users now to basically choose between these two rival OS's. (Kingsley-Hughes, 2016) Substantially, product loyalty and experience with the preferred operating system are major factors in consumer choice. IOS users like the innovative reputation of Apple. Android users are drawn to the large apps market created by Google's early decision to open source Android. From the pedagogical perspective, the major difference is in presentation potential and the available apps. Android has a slight edge in both respects for classroom use. Differences between IOS and Android are not well perceived by political science students.

Explaining that Android is Google's entry in the OS market does not succeed well in resolving unfamiliarity issues. Probably, the confusion about Android among students results from the various versions of Android now in use. The 4 versions of Android are considerably less sophisticated than the 6.0 version. Tablets, as well as smartphones, use Android, and a tablet's proficiency in classroom reality is vastly different version 4.0 to version 6.0. Because some tablets work well in the classroom and others are rather inadequate, substantial confusion exists about how tablets utilize Android OS.
Introduction of new ICT has often confronted implementation problems. Some really outstanding ICT ideas have failed because the technology was not accepted by the intended end users. Mutch discusses implementation problems with Lotus Notes. While this groupware was designed to promote knowledge sharing within organizations, the application rarely succeeded beyond being a simple email program. Program users had no interest in the high-end knowledge sharing features that were intended to promote substantial cooperation among organization members confronting the same tasks and problems. Implementation of knowledge sharing with Lotus Notes almost inevitably failed. (Mutch, pp. 103-104.)

In other instances, implementation of ICT has occurred with unexpected results. How ICT is used is substantially determined by the ICT users. Often adaptation of technology to practical situations results in innovative ICT usage. Not infrequently, what results is a use of ICT lacking implementation of high-end features. Lucas explains, "These kinds of changes
occur in the absence of explicit intentions and objectives for change. In fact, such changes cannot be anticipated in advance because people adapt to the technology as they use it. Such change can be a positive, unintended consequence of a new application." (Lucas, pp. 181-182)

Implementation has to be considered a major issue when Android use in the classroom is analyzed. Reasons for Android, subsequently presented, are persuasively supportive of Android in the classroom; however, significant obstacles exist to the implementation of all high end Android features. All those people who are needed to secure the implementation of classroom Android capabilities do not accept Android innovations as student reasonable. Experience with the prestigious Windows OS has left IT Departments slow to put together the IT reality Android now offers.

Possibly, the antitrust trouble Android has experienced is a factor causing a reluctance to support use of this OS in the classroom. April 2016, the European Commission alleged that Google had breached EU competition law. European Competition Commissioner, Margrethe Vestager, announced she had reached a preliminary view that Google was in breach of EU law. Competitors and consumers were alleged to be harmed by requirements on mobile manufacturers and operators to pre-install some of Google's products. The European Commission stated Google has about a 90% share in the markets for general Internet search services, licensable smart mobile operating systems and app stores for the Android mobile operating system. 80% of smart mobile devices run on Android. The European Commission
termed this Market position as dominant. For these infractions, Google may face a fine and could be required to change its practices. (Rawlinson, 2016)

In August 2016, Russia fined Google $6.8 million for preloading some of its own apps on Android smartphones. This practice was found to be in violation of Russia's antitrust laws. The ruling specified Google had abused its market dominance with Android. Originally, the antitrust authority opened the case in February 2015 when Russian search engine Yandex complained. Yandex, also, develops mobile apps and runs its own Android App Store. (Gross, 2016)

In the 1990s, Microsoft got in antitrust trouble for bundling Internet Explorer with their Windows OS. This effectively outflanked rivals like Netscape. The European Commission has objected to Google bundling Google App Store with Android OS. Harry First, New York University antitrust expert, commented on the European Commission's case by observing the tech world has changed radically since the Microsoft antitrust case. In the Microsoft era, people were unfamiliar with downloading and readily accepted a browser from the original equipment maker. Now, people are fully at ease downloading and have more than one app on their phone or tablet that does the same thing. (Manjoo, April 27, 2016)

Regulation analysis of anti-competitive practices may have similarly become more sophisticated since the Microsoft Era. Google is charged with standing in the way of
innovation. Denying consumers a wider choice of mobile apps and services is another current antitrust allegation. (Manjoo, April 27, 2016)

Evaluating the effect of anti-competitive practices allegations on implementation of Android OS support for classroom instruction cannot ignore how many apps are now found on devices. Possibly, the most important reason Android is attractive for classroom use is the number of apps available. As Monjoo comments, "The European charges miss the messy reality of life on Android, which is clear to anyone who studies the mobile software business: Android phones come teeming with non-Google apps, often to the point of frustration for users." (Monjoo, April 27, 2016)

Deciding whether innovation means introducing Google apps to the classroom is an enthralling question. Possibly, antitrust analysis could question the effect of Google's bundling Apps Market with Android OS on inhibiting classroom use of Android. ICT innovation could have more ordinarily favored classroom use of Android. The bundling practice may have obstructed institutional acceptance of Android. Presently, however, regulators do not appear willing to assess the affect of a questionably anticompetitive practices on innovation in this manner.

**Useful Android Apps for Studying Political Science**

Resolving implementation issues so as to allow more use of Android in political science education would be a desirable outcome. Ordinarily, matching instructional materials to ICT
devices in the hands of all students would produce significant gains. Substantially more complex graphical and media content could then inexpensively be made available to students. Interactive features in learning exercises could develop and accomplish improvements in learning techniques.

Word processing with Android has shown vast improvement between version 4.0 and version 6.0. The most recently introduced versions of Android allow speech dictation and are excellent for all word processing needs. The increasing importance of Android is undeniable when one compares the various speech dictation programs presently available. The most advanced versions of Windows have attempted to take over speech dictation as an internal features of Windows OS. Microsoft has not been astoundingly successful in the development of their speech recognition within Windows. Android similarly has made speech dictation a standard feature in their OS. Comparing Windows speech dictation with Androids speech dictation leaves no question that Android has established leadership. Android speech dictation is smooth, quick, and accurate. Correction of mistakes with Android speech dictation is effortless. Android 6 is the best product on the market for fast and ordinary speech dictation.

Since writing skills are important for successful students, the valuableness of Android is inescapable. The meaningful improvement in word processing found between Android version 4.0 and version 6.0 is so significant that future versions of Android are anticipated with great
Figure Two
Statistics Apps from the Google Apps Store

source – The Google App Store
These statistics apps can all be obtained from the Google Play Store.
interest. The more normal speech dictation is, the greater the productive significance of the productivity apps for Android 6.0 in political science education. Combining Android word processing apps with other educational useful apps can only become more important as Android's development increases in sophistication.

Social science statistics education can benefit substantially from Android. There are two types of Statistics apps now available to assist students learn about statistics. First, there are apps that present statistics concepts. Second Android apps allow accomplishing statistics as has been formally accomplished with Windows programs including Stata, SPSS, Winks, and AcaStat.

How students learn statistics concepts is substantially influence by what they read. There are many excellent statistics textbooks available for teaching social science statistics. Some authors communicate with students more effectively than others. Opinions among students about the writing strength of statistics authors evidences a substantial amount of individual difference. If students were able to read statistical authors they like, better statistics education would probably happen.

Statistics apps offer students many possibilities in political science education. Learning statistics enables students to read social science more effectively. Since almost all social science nowadays contains some statistical expression, knowledge of statistics is essential.
Efforts to encourage students to use statistics in their own projects, likewise, requires knowledge of statistical procedures. Useful knowledge of statistics is valuable for students for better social science comprehension and to improve original research. While the usefulness of statistics is not disputed, succeeding with getting students interested in the subject and obtaining results in improved knowledge can be difficult.

Statistics apps are excellent because students can readily perceive the user-friendly qualities of the app. While statistics were once difficult when the only programs that existed were unfriendly, now apps simplify difficult concepts and make obtaining results little different than word processing. Students have the ability to work with statistics apps on their devices which they commonly use. This creates an excellent opportunity for significant gains in understanding how to practically produce statistical analysis. The more students work with statistics in the familiar setting of their Android, the more thorough their knowledge of concepts, procedures, and computing techniques become. Affective learning about statistics can be anticipated from these conditions.

Besides word processing and statistics, Android apps have learning potential as they can help students with multimedia. Content from many sources can be a valuable supplement to political science courses. Many possibilities exist for interactive media delivery by Android apps. Together with platforms like Moodle, Android devices can allow the instructor to provide his students with content directly relevant to their course. Almost anything audio visual can be delivered directly to the Android device.
Improved student presentations can be anticipated with more use of Android devices. Various programs for creating presentation slides are available. Students can be asked to contribute to the classroom with presentations they devised using Android apps. The skillfulness of the presentations that result are influenced only by the students abilities and imagination. Combining graphics and various multimedia content allow some really excellent student presentations and can contribute significantly to a course's classroom experience.

**Chromecast and Miracast's Ability to Improve Class Room Presentations**

Probably, the strongest feature recommending Android use in the classroom is the OS's ability to presents on television equipment whatever appears on the screen of a smartphone or tablet. If a classroom is equipped with a projection system that would projector television image or a computer monitor image to a screen, Chromecast or Miracast would work excellently. Chromecast works with a router. The content on the screen is WiFied to the router and then WiFied to the Chromecast device attach to the television input. Miracast does not require use of a router. The signal from the tablet or smartphone go directly to the Miracast device attached to the television input. Both systems work with only pressing a few buttons and result in excellent video and audio emerging from the television.

The device that connects to the television is called a dongle. There are numerous manufacturers of dongles, but one of the more popular one is Netgear. Push2TV wireless display adapter is the name Netgear gives their dongle. Figure Three presents the instructions
Netgear provides for using their dongle with an Android device. The Miracast connection is quickly and effortlessly accomplished with this technology. At once, one is able to project whatever one is watching on their smartphone or tablet to the classroom's projection system. This works well whether one is watching a movie on Netflix or demonstrating a statistics app. The video and sound quality of the Miracast is excellent.

**Figure Three**

*Connecting Miracast from Android Devices*

**Step 1**
Turn on your TV and select the correct HDMI input source. The Ready for connection screen displays on your TV.

**Step 2**
Find the wireless display app on your Wi-Fi CERTIFIED Miracast smartphone, laptop, or tablet. The name and location of the app might differ by device.

**Step 3**
Use the wireless display software to find and connect to Push2TV.

**Step 4**
Follow the instructions on your TV to do one of the following:
- Enter a security code.
- OR
- Press the Push2TV side button.

**Congratulations**
You are now displaying your smartphone screen wirelessly on your TV.

source – Netgear instructions
These instructions are found when Netgear is unboxed.
From experience, I have only a few technical suggestions. Chromecast probably is adapted for use with more televisions than Miracast. All the technical capabilities required to quickly and effectively utilize Miracast are found in televisions manufactured within the preceding 2 or 3 years. This author's success with Miracast in televisions made a decade or so ago is not satisfactory. Chromecast appears to have more capability with older television equipment. Getting Miracast to work with the video input for older classroom projection equipment may take some specialized technical assistance.

**Computer Literacy and New Features of Android 6.0**

From the computer literacy perspective, Android has some features that are pleasing and improve one's knowledge of computer capabilities. Android is the first open source software to claim a large market share. Linux achieved success in data centers and business applications with an open source OS, but never successfully competed with Microsoft Windows. Google has made all the source codes for Android public releasing them under the Apache license. Devices such as the Kindle Fire and Barnes & Noble Nook tablet utilize Android, without much public awareness. While anyone can use and modify Android, the majority of successful Android hardware has been approved by Google. (Brodkin, 2012)

Ematic, a Chinese brand, is an example of an open source use of Android that has not been approved by Google. Lacking Google's approval, Ematic users cannot download a software from the Google App Store. Sometimes the open source use of Android causes confusion about the nature of the OS. The multiplicity of open source Android users together with
Google's policies for exercising more open source control than usual may be difficult to comprehend for some.

While some of the open-source issues may be confusing, plenty of the advanced features on the later versions of Android are becoming popularly accepted. Voice commands are an example. The later versions of Android are voice oriented. The speech dictation strengths of Android 6.0 have already been commented on in this paper. Android's use of voice extends to search and to commands directing performance of the OS. The voice features of the OS are popular because they work and because they suggest possibilities for future developments in the OS that are even more potentially useful.

Notifications are another popular feature. Appearing at the top of the screen, notifications become visible with a single swipe down from the top. Developers have liked notifications as they have been able to include new information from their apps at the top of the home screen. Version 6.0 has added a "dismiss all button" allowing users to clear all notifications at once. Swipe down twice and a quick settings area is revealed. Quick Settings include features like a brightness slider and toggles for WiFi, Bluetooth and mobile data.(Carlon, 2016)

Security features with 6.0 are also student attractive. More app permission features are included requiring approval each time the app is used. This feature is adjustable in the settings menu allowing more control over how apps are used. Automatic app backup lessens
the possibility of data loss. Network security resets quickly and easily removes all passwords, settings and connections associated with Bluetooth, cellular data and WiFi. Version 6.0 features full encryption which runs by default. (Carlon, 2016)

Literacy word processing skills in version 6 features improve text selection. Android has been criticized because the text selection feature was seen as clumsy. The new version has improved upon this feature substantially. Three options are now allowed including “select all,” “copy” or “share.” Customizable options can be added. For example, selected text can be sent to Google Translate. (Carlon, 2016) The agility with which the user can negotiate between various apps with text is becoming impressive in version 6.0. One can effortlessly edit information among apps as never before making the user's abilities with Android appear sophisticated.

Developments have been announced for the next version of Android, tentatively titled Android N. Daniel Howley, writing for Yahoo Finance explains, "The newest iteration of the world's most popular operating system gets improved security, performance, notification, and most interesting of all, virtual reality." (Howley, 2016) The usefulness of virtual reality in the classroom has not as yet seen much development. All indications are, however, that virtual reality makes a profound impression and could be useful in media that acquaint students with realities unfamiliar to them. Political institutions could valuably be presented with virtual reality. Other uses of virtual reality might include allowing students a sense of being present at political happenings.
Conclusion

The usefulness of Android in the political science classroom appears to be significant. Since almost all students have an Android device either smartphone or tablet, the possibilities for using this familiar and friendly ICT environment for educational objectives is tantalizing. Implementing classroom plans for Android support appears to be a difficult ICT implementation problem. Many instances exist where well-devised ICT plans fail in the implementation stage. Now, Android support in the classroom cannot solve some implementation concerns. The paper has questioned whether Google's anti-competitive practices may have had an adverse effect on implementing Android classroom designs.

Substantial incentives have been explained that encourage efforts to get Android support in the classroom. Android's valuableness in word processing, learning statistical concepts, and accomplishing statistical reports all have been mentioned. As a presentation system, Android has been found to have no equal. Using Chromecast or Miracast an instructor could present limitless combinations of instructional multi-media. Apps to accomplish statistical analysis could be demonstrated to a classroom.

The potential for Android to positively affect the level of student computer literacy has been discussed. The sophistication of Android recommends more educational use of this OS. The later versions of Android have a sophistication in computing that is truly impressive. Following the most recent innovations in the OS is convincing that each subsequent version
accomplishes substantial learning about computing. Positive developments in data presentation, editing, security, and knowledge organization all convince that Android has real potential in improving student computer strength. New plans for a subsequent version of Android include virtual reality. Classroom possibilities with virtual reality are many as this technology could assist students learn about political institutions and our political process.
Bibliography


