

# Best Practice: EDUCATION

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## ***Key Points***

- Use **Timewarp** (TW) for practical sessions at primary or secondary level.
- Use **Silicon coach Live** (SC Live) so students can experience a hands-on approach to learning biomechanics, functional anatomy and movement analysis skills at secondary or tertiary level. Also included are learning resources that have been created specifically for education at secondary and elementary tertiary levels.
- Use **Digitiser** to teach the concepts of full body digital analysis at tertiary level.

## ***Introduction***

Video analysis and feedback is like, teaching, it’s a combination of art and science.

The science is not definitive and this is really no surprise given the huge variety of people and the vast numbers of movements available to analyse. However, there are some general guidelines that can help anyone wanting to capture, analyse and give feedback to those students.

This document pulls together information from a variety of sources into a collection of clear guidelines. These guidelines should be used in conjunction with good teaching practice.

The Siliconcoach products mentioned in this resource will be:

<b>SC Live</b>	SC Live is an online learning environment where students can work through lessons, undertake movement analysis and partake in discussions with classmates.
<b>Timewarp</b>	A delayed playback system designed for use in the session for immediate feedback and minimal disruption.
<b>Digitiser</b>	A tool designed for students in tertiary education to learn about digitising motion.

**NOTE:** To find out more go to [www.siliconcoach.com](http://www.siliconcoach.com) and click on **Products** on the top menu.

## ***Preparation***

- If you are using **Timewarp** you are working with live-delayed video so you must be using a camcorder connected to your computer providing a live feed. To find out more information go to [www.siliconcoach.com](http://www.siliconcoach.com) and click on **Support** on the top menu then look on the Timewarp Support Centre and look for the Hardware resource link.
- If you are using **SC Live** you will capture your video on virtually any device and then upload it to the web using the SC Live uploaders. To find out more information go to [www.siliconcoach.com](http://www.siliconcoach.com) and click on **Support** on the top menu then look on the Uploaders Support Centre.
- If you are using **Digitiser** you can only use DV AVI files.
- Capturing your footage. There is a trade-off between capturing in a match situation and in a practice situation. Footage from a match gives you the athletes performing under the pressure of the competition; however, it often doesn't give you good video as you can never be sure where they will be during the game. Further, they're almost never at right angles to the camera which creates perspective error during analysis. A practice session gives you control over the athletes position but takes away some of the pressure. Some sports like tennis, gymnastics, athletics, swimming, track cycling, weightlifting and volleyball are not so bad but the likes of football, hockey, road cycling, rugby, etc are very hard. The best option in these situations is match simulation drills with as much pressure as possible.
- Light is the biggest factor in getting a good image. If your clip looks blurred it is not the software, set your camera to a higher shutter speed or to Sports Mode and boost the lighting. To find out more information go to [www.siliconcoach.com](http://www.siliconcoach.com) and click on **Support** on the top menu then look at the Timewarp or SC Live support pages for the How to get good video resource.
- Use a tripod and set it at height equal to the middle of the total height of the movement you are studying.
- If you want to take distance or speed measurements off the video you will need an object of a known length (calibration scale) in the same plane as the movement and the same distance from the camera as the movement.
- To minimise perspective error you should capture from right angles to the movement or in line with the movement.
- If you want to measure angles and distances, position the camera back far enough so you don't have to pan the camera. You can pan the camera if you are only 'eyeballing' the movement or using time measurements.
- Generally a laptop is the most versatile type of computer.
- For more information go to [www.siliconcoach.com](http://www.siliconcoach.com) , click on **Solutions** on the top menu and look for the **Education** option.

## Primary Education

### Practical Sessions

<b>What</b>	<b>Timewarp</b> (More information at <a href="http://www.siliconcoach.com">www.siliconcoach.com</a> and click on <b>Products</b> from the top menu)
<b>Why</b>	<ul style="list-style-type: none"> <li>• Any sized group.</li> <li>• Fun and engaging for students because skills are being acquired faster.</li> <li>• Allows students to see their own technique, this accelerates learning from basic movements through to more complex skills.</li> <li>• Spend time to save time. Providing feedback to your students results in a faster uptake.</li> <li>• Less repetition of the instructions because they can see what you mean and they 'get it' faster.</li> <li>• Easy to use, just set the required time delay and forget it until the end of the class.</li> </ul>
<b>How</b>	<ul style="list-style-type: none"> <li>• Set the Timewarp delay ('Warp') to an appropriate period, usually about 5 – 15 seconds. The great feature here is you do not need to touch the computer at all from now on, ideal for a busy teacher.</li> <li>• Have the students do the activity then come around and watch themselves on the screen, you then make a simple suggestion for them to try next time and they get back in line ready to try again.</li> <li>• The computer could be connected to a data projector or an electronic white board to make the image bigger and easier to see.</li> </ul>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• <b>Forward roll:</b> Set the camera up on the side of a gymnastics mat and connect it to the computer. Start Timewarp and set it to a 15 second delay before it plays back. The students line up and perform the forward roll then come around and look at themselves on the screen 15 seconds after they did it. You don't touch the computer at all but are free to give them key points to try next time. This doubles the time-on-task the students get compared to normal "one at a time" learning scenarios.</li> <li>• <b>Skipping/Running:</b> The same set up and method as for the forward roll outlined above but the camera may have to be positioned further back to get a few steps in shot.</li> <li>• <b>Basket ball shot:</b> The same set up as above but this time use a data projector or electronic whiteboard (although these are less portable) to give a big screen view of the students. This can be done after students get used to seeing themselves and others on the small screen. Once on the big screen you can teach the students to self analyse and also learn to give positive and constructive feedback to their fellow students.</li> <li>• The same principles could be applied to all basic movements.</li> </ul>

## Secondary Education

### Practical Sessions

<b>What</b>	<b>Timewarp</b> (More information at <a href="http://www.siliconcoach.com">www.siliconcoach.com</a> and click on <b>Products</b> from the top menu)
<b>Why</b>	<ul style="list-style-type: none"> <li>• Any sized group.</li> <li>• Fun and engaging for students because skills are being acquired faster.</li> <li>• Allows students to see their own technique, this accelerates learning from basic movements through to more complex skills.</li> <li>• Spend time to save time. Providing feedback to your students results in a faster uptake.</li> <li>• Less repetition of the instructions because they can see what you mean and they 'get it' faster.</li> <li>• Easy to use, just set the required time delay and forget it until the end of the class.</li> </ul>
<b>How</b>	<ul style="list-style-type: none"> <li>• Set the Timewarp delay ('Warp') to an appropriate period, usually about 5 – 15 seconds. The great feature here is you do not need to touch the computer at all from now on, ideal for a busy teacher.</li> <li>• Have the students do the activity then come around and watch themselves on the screen, you then make a simple suggestion for them to try next time and they get back in line ready to try again.</li> <li>• The computer could be connected to a data projector or an electronic white board to make the image bigger and easier to see.</li> </ul>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• <b>Gymnastics:</b> Set the camera up on the side of a gymnastics mat and connect it to the computer. Start Timewarp and set it to a 15 second delay before it plays back. The students line up and perform the skill then come around and look at themselves on the screen 15 seconds after they did it. You don't touch the computer at all but are free to give them key points to try next time. This doubles the time-on-task the students get compared to normal "one at a time" learning scenarios.</li> <li>• <b>Volleyball shot:</b> The same set up as above but this time use a data projector or electronic whiteboard (although these are less portable) to give a big screen view of the students. This can be done after students get used to seeing themselves and others on the small screen. Once on the big screen you can teach the students to self analyse and also learn to give positive and constructive feedback to their fellow students.</li> <li>• <b>Basketball play:</b> An adaption of the volley ball idea above but this time run an offensive or defensive play and then get the group to gather around the data projector screen and all discuss what they saw and what needs to be done to improve it. The computer will have to be positioned further back or get a non-participant involved by panning the camera to follow the action.</li> <li>• The same principles could be applied to all movements.</li> </ul>

## Classroom Sessions

<b>What</b>	<b>SC Live</b> (More information at <a href="http://www.siliconcoach.com">www.siliconcoach.com</a> and click on <b>Products</b> from the top menu)
<b>Why</b>	<ul style="list-style-type: none"> <li>• Any sized group.</li> <li>• Fun and engaging for students.</li> <li>• Learning resources available within SC Live.</li> <li>• Less repetition because they can see what you mean and they ‘get it’ faster.</li> <li>• Runs in the Internet Browser so it works on Windows and Mac</li> <li>• Allows students to see their own technique, this accelerates learning from basic movements through to more complex skills.</li> <li>• Spend time to save time. Providing feedback to your students results in a faster uptake.</li> <li>• Students can see feedback visually, eliminating verbal misunderstandings.</li> <li>• 60/50 images per second of clarity.</li> <li>• Highlight key points in a video by drawing directly on-screen.</li> <li>• Accurate analysis leads to higher quality training and performance.</li> <li>• Synchronise multiple video clips for side-by-side or overlaid comparison.</li> <li>• Measure key events using the time, angle, distance and speed tools.</li> </ul>
<b>How</b>	<ul style="list-style-type: none"> <li>• You can either present to the class while operating the software and a computer projector or have the students using it themselves in self-directed learning.</li> <li>• You may want to capture your own video clips to use in your teaching. You can capture on virtually any normal camcorder/phone and then upload it to the web site. You should generally capture your footage before the session begins.</li> <li>• Generally you should only capture 5 to 10 second clips as you are capturing one skill not a whole section of play. For example you would capture one movie clip for each kick, pass, jump, stroke, throw, etc. This gives you smaller files and much more flexibility for future analysis.</li> <li>• <b>Teaching Biomechanics and Functional Anatomy</b> <ul style="list-style-type: none"> <li>○ Purchase the College Pack. For more information go to <a href="http://www.siliconcoach.com">www.siliconcoach.com</a> , click Products and then choose SC Live.</li> <li>○ Use video clips to explain the principles in a very dynamic way.</li> <li>○ You could use dual screen options in conjunction with line and measuring tools to help with this</li> <li>○ Use a data projector or electronic whiteboard to show students what to do and then let them do it themselves online.</li> </ul> </li> <li>• <b>Learning and Analysing skills</b> <ul style="list-style-type: none"> <li>○ The SC Live College Pack also comes with printable PDF resources to help run your lessons.</li> </ul> </li> </ul>

**Examples**

- Have students move from just looking at their general form to include specifics. For example the relative positions of each limb, the centre of mass relative to the base of support, the timing of segments, etc.
- You might have them measure a few basic angles on either the expert or your student/model. If they are comparing the expert's numbers to your student's results make sure the angles they measure are in the plane of the camera and they don't get caught up in small changes in angles. Use angles as ranges not specific targets. For example "*under about 130 to 140*", "*somewhere between 30 and 40 degrees*" etc.
- They need to remember there is more than one way to perform the same skill and there are also errors in the measuring process so should not get too focused on numbers. Use them as part of the analysis, not all of it.

## Tertiary Education

### Classroom Sessions

<b>What</b>	<b>SC Live and Digitiser</b> (More information at <a href="http://www.siliconcoach.com">www.siliconcoach.com</a> and click on <b>Products</b> from the top menu).
<b>Why</b>	<ul style="list-style-type: none"> <li>• Any sized group.</li> <li>• Use it as a review of basic concepts they may have not learnt of may have forgotten since high school.</li> <li>• Fun and engaging for students.</li> <li>• Learning resources available within SC Live.</li> <li>• Less repetition because they can see what you mean and they 'get it' faster.</li> <li>• Runs in the Internet Browser so it works on Windows and Mac</li> <li>• Allows students to see their own technique, this accelerates learning from basic movements through to more complex skills.</li> <li>• Spend time to save time. Providing feedback to your students results in a faster uptake.</li> <li>• Students can see feedback visually, eliminating verbal misunderstandings.</li> <li>• 60/50 images per second of clarity.</li> <li>• Highlight key points in a video by drawing directly on-screen.</li> <li>• Accurate analysis leads to higher quality training and performance.</li> <li>• Synchronise multiple video clips for side-by-side or overlaid comparison.</li> <li>• Measure key events using the time, angle, distance and speed tools.</li> </ul>
<b>How</b>	<ul style="list-style-type: none"> <li>• You can either present to the class while operating the software and a computer projector or have the students using it themselves in self-directed learning.</li> <li>• You may want to capture your own video clips to use in your teaching. You can capture on virtually any normal camcorder/phone and then upload it to the web site. You should generally capture your footage before the session begins.</li> <li>• Generally you should only capture 5 to 10 second clips as you are capturing one skill not a whole section of play. For example you would capture one movie clip for each kick, pass, jump, stroke, throw, etc. This gives you smaller files and much more flexibility for future analysis.</li> <li>• <b>Teaching Biomechanics and Functional Anatomy (SC Live)</b> <ul style="list-style-type: none"> <li>○ Purchase the College Pack. For more information go to <a href="http://www.siliconcoach.com">www.siliconcoach.com</a>, click Products and then choose SC Live.</li> <li>○ Use video clips to explain the principles in a very dynamic way.</li> <li>○ You could use dual screen options in conjunction with line and measuring tools to help with this</li> <li>○ Use a data projector or electronic whiteboard to show students what to do and then let them do it themselves online.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Learning and Analysing skills (SC Live)</b> <ul style="list-style-type: none"> <li>○ The SC Live College Pack also comes with printable PDF resources to help run your lessons.</li> </ul> </li> <li>• <b>Digitising movement manually (Digitiser)</b> <ul style="list-style-type: none"> <li>○ Capture DV AVI video clips.</li> <li>○ Follow the instructions in Digitiser to create a Stick Figure and then digitiser each frame of the movement.</li> <li>○ Export the data to excel and undertake more detailed analysis. There are no analysis features in Digitiser.</li> </ul> </li> </ul>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• Have students move from just looking at their general form to include specifics. For example the relative positions of each limb, the centre of mass relative to the base of support, the timing of segments, etc.</li> <li>• You might have them measure a few basic angles on either the expert or your student/model. If they are comparing the expert's numbers to your student's results make sure the angles they measure are in the plane of the camera and they don't get caught up in small changes in angles. Use angles as ranges not specific targets. For example "<i>under about 130 to 140</i>", "<i>somewhere between 30 and 40 degrees</i>" etc.</li> <li>• They need to remember there is more than one way to perform the same skill and there are also errors in the measuring process so should not get too focused on numbers. Use them as part of the analysis, not all of it.</li> </ul>