

# Comparison and Recommendations for Low-Cost Digital Video Recorders in Early Intervention and Early Care and Development

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Which low-cost digital video recorders are best for use in professional development, technical assistance, supervision, coaching, and service delivery activities? There are many good choices and new brands and models appear very frequently and current models are updated or discontinued all the time. The model that will be best for you depends on your purposes for using video and the features that you need or want. The chart below might help you get an idea of which features are most important to you.

Features to Consider	Why These Features Might Matter
Format	Decide if you want/need SD (standard definition) or HD (high definition). HD has a better image but also much larger file sizes.
Video compression	Find out what video format the camcorders record in and if that format suits your needs for your end product, editing, posting, and playing. Not all formats work equally well on PCs and Macs. And not all formats can be imported into the video editing software that you like to use; you may need to transcode file formats or choose a different editing application. The most common formats lately seem to include .MP4 and .mov, and less often .avi.
Record in different file sizes	Some camcorders just have one setting. Other camcorders let you choose between two or more sizes, so you can choose the largest size for viewing and smaller sizes for posting on the web, emailing, etc.
Battery	Does the camcorder come with its own unique type of battery (e.g. rechargeable lithium) or can you use batteries that can be readily purchased anywhere? Which do you prefer?
Rechargeable battery	Some camcorders use rechargeable batteries and some use disposable batteries. Each has its own advantages and disadvantages. Figure out what works best for you. If the batteries are rechargeable, find out how to recharge them, e.g. through an external charger or by plugging the camcorder into your computer. If you recharge by plugging the camcorder to a computer, you can't use the camcorder while the battery is charging. If the camcorder uses a rechargeable battery, you might want to buy a spare so that when your battery loses its charge you have another to replace it before you can get around to recharging.
Tripod port	You need this port on the bottom of the camcorder so you can screw it into a tripod.
Zoom	Very important so you can capture the action without being obtrusive. Optical zoom is vastly desirable over digital zoom. The higher the optical zoom, the better. In this

Features to Consider	Why These Features Might Matter
	class of recorders, the range of optical zoom is usually between 0 and 5x.
Storage	Amount of internal and external memory. All camcorders come with internal memory but not all have removable external memory cards. Having removable storage is a very important feature, especially if two or more people will be sharing the camcorder. I recommend that you purchase a camcorder that uses removable SD cards if it will be shared; that way, each user can have her or his own card. When the camera is transferred from one person to the next, you can simply remove your card to avoid loss of files.
Storage capacity	Storage capacity refers to how much video (measured in length of time or bits of data) can be stored in the camcorder before needing to transfer the video files to another storage device. Camcorders that record in different file sizes will have variable storage capacity depending on the size of video recorded. Storage capacity varies according to factors such as color saturation and the complexity of what you record, e.g. movement of the subject being recorded.
File size of one minute of video	This is the size of one minute of video. File size matters for storage and portability. It also might matter if you plan to email a file or upload it to a system that has size limitations. You can use software to compress the file to a smaller size, but that adds an additional step and also lessens the quality of the clip. In my recent test of about 10 camcorders in this class, the file size of one minute of video varied from 4 MB to 82 MB.
Take still photos	Some camcorders have a dedicated still photo function while others don't. If you want to be able to take still photos, definitely choose a camcorder with a dedicated still photo function. With some you can capture a frame of video as a still.
Manual lighting settings	Also referred to as exposure controls. Some camcorders enable you to switch the lighting settings so that you will get better results in different situations, e.g. indoors, outdoors, etc. while other camcorders use only one automatic setting that adjusts (theoretically) to various lighting conditions.
Display monitor size	This is the size of the viewer.
Does the display monitor swivel	This indicates whether or not the display can be rotated in various directions so that the videographer can shoot from different angles or so that a person being shot can monitor themselves. This is a very important feature if you will be included in the action. By using this feature you can easily see if you are capturing what you want to capture. Without it, it's hit or miss.
Editing software	Find out if the camcorder comes with its own editing software (this is not essential because there are plenty of free and low-cost software applications available). If so, does editing happen inside the camcorder or on a computer? Almost all camcorders can download files to both Macs and PCs, but not all of the editing software that comes bundled with the camcorders works on both platforms.
Minimum illumination for video clip	This tells you how well the camcorder will capture good video in dark settings. The lower the better.
Accessories included	This lists what come in the box. In addition, the camcorders come with some level of a getting started guide and some come with detailed manuals. In addition to what comes in the box you can buy optional accessories.
Price	Expect to pay between \$100 - \$200, plus shipping, tax, and extra accessories.

Camcorders that I Recently Tested	
	<b>Sanyo Xacti VPC-CG20</b> Amazon price on 3/12/11: \$139
	<b>Flip Ultra HD 2 Hours (3rd generation)</b> Amazon price on 3/12/11: \$125
	<b>Flip SlideHD</b> Amazon price on 3/12/11: \$199
	<b>Zoom Q3 Handy Digital Camcorder Video Recorder</b> Amazon price on 3/12/11: \$199
	<b>KODAK Zi8 Pocket Video Camera</b> Amazon price on 3/12/11: \$99
	<b>Sony Bloggie Touch Camera 8 GB 4 hours</b> Amazon price 3 on /12/11: \$155

## The Specs

Specs	Sanyo Xacti VPC-CG20	Flip UltraHD	Flip SlideHD	Zoom Q3	KODAK Zi8	Sony Bloggie Touch
Format	SD and HD .mp4	HD .mp4	HD .mp4	SD .mov	HD and SD .mov	HD and SD .mp4
Compression	MPEG-4 AVC/H.264 (.MP4)	H.264 MP4	H.264 MP4	MPEG4-SP	H.264	
Records in different sizes?	Y, Full-HD: 1920 x 1080 (60 fields / sec., 16 Mbps), Full-SHQ: 1920 x 1080 (30 fps, 12 Mbps), HD-HR: 1280 x 720 (60 fps, 12 Mbps), HD-SHQ: 1280 x 720 (30 fps, 9 Mbps), TV-SHQ: 640 x 480 (30 fps, 3 Mbps)	N; 720p HD, 60 fps	N; 720p HD, 30 fps	N, 640 x 480, 30 fps	Y, HD (16:9) 30 fps: 1920 x 1080 @ 30 fps; HD (16:9) 60 fps: 1280 x 720 @ 60 fps; HD (16:9) 30 fps: 1280 x 720 @ 30 fps; WVGA (16:9) 30 fps: 848 x 480 @ 30 fps	Y, 12M 1920x1080 (29.97p): 40 min. 6M 1280x720 (59.94p): 80 min. 4M 1280x720 (29.97p): 120 min.
Battery type	Lithium-ion	Flip Video Lithium-ion Battery Pack (included) or 3 AAA Lithium Batteries	Internal Lithium-ion	(2) AA batteries Optional: two AA-sized Ni-MH rechargeable batteries with dedicated charger, or an AC adaptor	KODAK 5V AC adapter, or KODAK Li-Ion Rechargeable Digital Camera Battery KLIC-7004	Internal (NP-SP70 3.6V)
Rechargeable battery?	Y. Comes with external charger	Optional, via	Y, via USB	Optional	Y	Y
Video Recording Time between charges	Approx. 1 hr in full HD	Up to 1.5 hrs	Up to 2 hrs	Up to 2 hrs	Approx. 1.5 hours in video recording mode, 720p @ 30 fps	
Tripod Port	Y	Y	Y	Y	Y	Y, vertical only
Zoom	Approx. 12x digital	2x digital	2x digital	2X digital	4x digital	4x digital
Storage	Internal: 30 MB	Internal: 8 GB	Internal: 16 GB	External: SDHC	Internal: 20 MB External:	Internal : 8GB Flash

Specs	Sanyo Xacti VPC-CG20	Flip UltraHD	Flip SlideHD	Zoom Q3	KODAK Zi8	Sony Bloggie Touch
	External: SDHC Memory Card (Up to 32 GB SDHC Memory Card)			memory card (4GB-32GB)	SDHC memory card (4GB- 32GB)	Memory
Storage capacity (as reported by manufacturer)	1 - 4 hours of video with a 8GB SDHC memory card, 4 - 16 hours of video with a 32GB SDHC memory card	2 hours	4 hours	Up to 16 hours of video with a 32GB SDHC memory card	about 20 minutes per 1 GB at 720p HD at 30 fps	4 hours
Take still photos	Y, 12 MP	N, Can capture still photos from video	N, , Can capture still photos from video	Y, 3 MP	Y, Still (16:9): 5.3 MP picture	Y, 12 MP; 16:9: 8.3M (3840 x 2160); 2M (1920 x 1080)
Record audio only	Y	N	N	Y	N	N
External stereo microphone jack	N	N	N	N	Y	N
Headset output	N	N	N	Y	Y	N
Lighting settings	Auto and manual	Auto	Auto	Auto	Auto	Auto
Display monitor size	2.7 "	2 "	3 "	2.4 "	2.5"	3.0"
Does display monitor swivel?	Y	N	N	N	N	N
Come with editing software?	Y	Y	Y	Y, PC only	Y, PC only	Y
Accessories included	USB Cable, AV Cable, Li-ion Battery, Lens Cap, Li-ion Battery Charger, manual	Rechargeable Battery Pack, wrist strap, soft protective case, user guide	Soft Case, TV cable, wrist strap	2 AA Ni-MH batteries, AV cables, wrist strap, soft pouch, windscreens, 2 GB SD card	Li-Ion Rechargeable Digital Camera Battery KLIC-7004, HDMI and AV cables, wrist strap, User Guide, ARCS OFT MEDIA IMPRESSIO N Software for Kodak (PC only)	USB connection support cable, wrist strap

## File Formats, Sizes, and Media Players for PCs and Macs

Specs	Sanyo Xacti VPC-CG20	Flip UltraHD	Flip SlideHD	Zoom Q3	KODAK Zi8	Sony Bloggie Touch
File type	.MP4	.MP4	.MP4	.MOV	.MOV	.MP4
File size of one minute of video on a PC (+/- 2 seconds)	FullHD 124.1 MB	63.8 MB	67.1 MB	31.9 MB (with audio set on mp3 128kbps auto)	1080p 77.6 MB	1080-30p 85.1 MB
	FullISHQ 101.1 MB				D720p 60fps 56.9 MB	720-60p 41.3 MB
	HDHR 90.5 MB				D720p 55.7 MB	720-30p 30.5 MB
	HD SHQ 71.2 MB				MVGA 27 MB	
	TVSHQ 25.9 MB					
File size of one minute of video on a Mac (+/- 2 seconds)	FullHD 127.1 MB	65.3 MB	68.7 MB	32.7 MB (with audio set on mp3 128kbps auto)	1080p 79.4 MB	1080-30p 87.2 MB
	FullISHQ 103.5 MB				D720p 60fps 58.3 MB	720-60p 42.3 MB
	HDHR 96.8 MB				D720p 57.1 MB	720-30p 31.3 MB
	HD SHQ 72.9 MB				MVGA 27.7 MB	
	TVSHQ 26.5 MB					

## Media Players

All video files produced by all of these camcorders can be viewed on both PCs and Macs using these free media players:

QuickTime Player: <http://www.apple.com/quicktime/>

VLC Media Player: <http://www.vclmediaplayer.net>

## Basic Editing, Compression and Transcoding

All video produced by all of these camcorders can be viewed, trimmed, joined, compressed, and transcoded on both PCs and Macs using:

MPEG Streamclip: <http://www.squared5.com/>

## My recommendations (at least for today)

There are many fine choices for digital video recorders in the \$100-\$200 price range and the choices change all the time. But if I were pressed to make some recommendations today, based on the camcorders that I tested, I would recommend the following.

### **Best All-Around: Sanyo Xacti VPC-CG20**

I recommend the Sanyo Xacti VPC-CG20 as the best all-around camcorder for early intervention and early care and education practitioners. Why? Because it is the only camcorder that I have tested to date that has ALL of the key features that are essential TO ME:

- It works well with PCs and Macs.
- It uses a removable SD card expandable to 32 GB so that providers can share the camcorder, but maintain their own storage devices.
- It has one of the largest display monitors of all of the camcorders that I tested, plus it is the only one of the bunch with a swivel display (a very useful feature).
- It can record in 5 video file sizes, including one SD setting and four HD settings.
- It has 12x optical zoom, the highest of all of the bunch.
- It does not produce the best video or the best audio compared to the other camcorders tested, but the quality is good enough for most purposes. If the best video and audio qualities are the most important features for you, read below.
- It produces MP4 files using AVC/H.264 compression and edits well on PCs and Macs.
- It takes good still photos.
- It can record audio only.
- It has decent battery life and uses rechargeable batteries that are recharged using an external charger, so you can use the camcorder while charging a spare battery.
- It has a variety of preset lighting settings.
- You can edit video right in the camcorder or with your own editing software.

### **Best Audio: Zoom Q3 or Kodak Zi8**

If you are looking for the best audio in this class with a built-in microphone, choose the Zoom Q3. The Kodak Zi8 comes in second for audio and is also the only camcorder in this class with a jack for an external microphone which could be a very important feature for you.

### **Best New Versions: Sony Bloggie Touch and Kodak Zi8**

I didn't like the original Bloggie, but this update is spectacular. It's the smallest of the bunch in size, but the quality of the video, audio, and photos is fantastic – it may have the best video quality of the bunch. This camcorder is really fun and it is my favorite to use. The only downside for me is that it has a vertical tripod port for taking stills, but not a horizontal one, so you'll need a tripod (such as the Gorilla video model) that can keep the camera in the horizontal position for shooting video. If this doesn't bother you, it's an amazing camcorder. I also didn't like the original Kodak Zi6 very much, but the Zi8 is a fantastic camcorder and a great buy. The video and audio quality is superb, it has a jack for an external microphone, and it is the cheapest of the bunch at just under \$100.

### **Best for a Loaner: Flip Ultra HD**

The Flip Ultra HD has good video and audio quality and is very popular, but comes in last when its features are compared with the other camcorders in its class, e.g. it has the shortest zoom, the smallest storage, the smallest display, no ability to take still photos, etc. So this would never be among my top choices for the camcorder I would want to use. However, if I wanted the easiest-to-use, durable camcorder to use as a loaner for children, families, service providers, etc., I would choose the Flip Ultra HD.

### **Useful accessories:**

Most come with a wrist strap and, when needed, a lens cap. Other accessories come standard with some models but are optional with others – be sure to read the descriptions of “what comes in the box”). Here are things you may need:

- Tripod
- Extra and/or larger SD card
- Padded carrying case
- Spare rechargeable battery and/or battery charger
- AC power module
- Editing software

### **Some Innovative New Video Camcorders to Check Out**

Looxcie Wearable Camcorder: <http://www.looxcie.com/>

Viewsonic Pocket Camcorder Projector: <http://www.viewsonic.com/products/dvp5.htm>

3M™ Camcorder Projector Shoot 'n Share CP40: <http://www.3m.com/shootnshare/>

### **Please remember:**

This document reviews only a handful of camcorders in the \$100-\$200, point and shoot, drag and drop files class. If you want higher quality video or more features you may very well want to move up to the next class of camcorders. A good guide for purchasing camcorders based on class of equipment and cost can be found at:

<http://reviews.cnet.com/camcorder-buying-guide/>