

Supplementary Information

Figure S1. Survey designed to assess the usefulness of a pedagogical tool developed to enhance students' learning experience.

Thank you for participating in this survey. Your answers will help determine if and how students benefit from video course supplements. This survey will take about 5 minutes to complete.

1. Approximately what proportion of the available videos did you watch?

- 100 %
- More than half
- Less than half
- I did not watch the videos

2. What time of day did you usually access the videos?

- Morning
- Afternoon
- Evening
- Night (after 10pm)
- At least two of the above
- I don't remember

3. How many videos did you usually watch in one sitting?

- 1
- 2-5
- 6-10
- More than 10
- I'm not sure/don't remember

4. Did you ever decide to watch videos instead of attending class?

- No
- Yes, once
- Yes, about $\frac{1}{2}$ of the time
- Yes, every time
- I'm not sure/don't remember

5. Did the videos assist your learning?

- Yes
- No
- I'm not sure

6. Did you attempt to solve the learning objectives on your own, before accessing the videos?

- Always
- Most of the time
- Sometimes
- Never
- I don't remember

7. Do you agree with the following statements?

I liked having the freedom to control the pace of the videos.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

I liked having the freedom to repeat sections of the video.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

8. How important was it to you that the narrator in the videos was the professor?

- Very important
- Somewhat important
- Somewhat unimportant
- Very unimportant

9. Do you think seeing the speaker's face would improve your learning experience?

- Yes
- No
- I'm not sure

Table S1. Details of each learning objective and the corresponding video.

Lecture	lecture duration	learning objective	duration video	number_views	Time_viewed
DNA structure Central Dogma	80 min.	#1 Tautomeric forms of DNA	3:37	142	5:14:09
		#2 3 helical structures of DNA	3:44	174	5:31:24
		#3 Hydrophobic effect and DNA	3:15	163	5:40:32
		#4 Structural flexibility of DNA	4:25	101	5:27:52
		#5 DNA supercoiling	1:48	128	2:58:49
		#6 Central Dogma	2:00	96	2:28:13
		#7 Sequencing of human genome	3:42	96	4:08:34
		#8 Central Dogma not exact	6:41	104	7:57:22
Genomes	2 x 80 min.	#1 DNA coiling in vivo	5:45	121	8:35:07
		#2 DNA packaging prokaryote	2:35	91	3:18:30
		#3 DNA packaging eukaryote	3:02	98	3:39:51
		#4 Mobile element prokaryote	5:58	107	8:12:01
		#5 Pro vs Eukaryote Genomes	3:40	100	3:59:35
		#6 Karyotype	4:29	88	5:04:08
		#7 Human genome	4:03	95	4:37:03
		#8 Mobile elements human genome	5:27	102	7:16:32
		#9 Sequencing of genomes incomplete	6:22	85	6:52:08
DNA Replication	80 min.	#1 Energy for DNA synthesis	3:34	95	4:11:26
		#2 DNA synthesis from dNTP	5:10	76	5:38:12
		#3 Direction of DNA synthesis	6:56	92	8:26:47
		#4 DNA Replication: discontinuous	6:37	107	6:51:47
		#5 DNA Replication fidelity	3:56	88	4:05:34
		#6 Formation replication bubble	4:41	93	4:32:46
		#7 Initiation complex of replication	5:52	90	5:58:04
		#8 Replication refractory period	2:44	85	3:05:27
		#9 DNA pol co-factors	5:10	68	4:53:47
		#10 Telomeres replication	3:21	76	3:35:18
		#11 Topoisomerases	6:16	83	6:11:59

Table S1. Cont.

Lecture	lecture duration	learning objective	duration video	number_views	Time_viewed
DNA Repair	80 min.	#1 Sources of DNA mutations	6:53	101	7:22:01
		#2 Tautomerism and mutations	3:13	90	3:14:24
		#3 Three mechanisms of DNA repair	2:15	79	4:13:38
		#4 Mismatch repair	4:06	77	2:31:28
		#5 Base excision	4:13	73	4:09:46
		#6 Nucleotide excision	4:01	71	3:41:41
		#7 Double strand break	3:47	67	3:27:53
		#8 Pyrimidine dimer	3:14	67	2:30:25
DNA Recombination	2 x 80 min.	#1 Gene conversion	2:39	93	2:50:15
		#2 Homologous recombination	6:38	102	7:16:32
		#3 Nucleation	3:56	95	4:10:59
		#4 matching homologous strands	3:46	92	3:44:27
		#5 RecA	3:55	96	4:36:13
		#6 RecBCD	5:44	112	6:17:17
		#7 Holiday junctions	7:24	128	8:11:34
		#8 Retroelements	3:32	112	4:01:39
		#9 Mobiles elements	5:50	99	3:24:31
		#10 Controlling transposition	5:17	80	5:11:39
Regulation gene expression prokaryote	80 min.	#1 Control of initiation	2:46	101	2:50:00
		#2 Positive vs negative controls	4:54	81	5:45:02
		#3 Operon	1:54	149	2:12:28
		#4 Repression of lactose operon	2:58	52	2:09:20
		#5 Positive control of lactose operon	3:50	88	4:00:29
		#6 Glucose availability	7:27	82	6:44:25
		#7 Trp operon	2:09	77	2:21:58
		#8 Repression of trp operon	2:15	70	2:09:53
		#9 Lactose vs trp operon	3:49	72	3:23:45

Table S1. Cont.

Lecture	lecture duration	learning objective	duration video	number_views	Time_viewed
		#10 Attenuation	8:04	98	7:56:11
		#11 Coupling of transcription and translation	7:19	79	5:46:34
Regulation gene expression phage	80 min.	#1 Lytic vs lysogenic modes	1:57	78	2:10:28
		#2 Repressors and anti-terminators	5:01	76	5:34:22
		#3 Phases of lytic mode	7:15	93	7:56:29
		#4 lytic mode and cascade of expression	3:15	62	3:05:34
		#5 Lysogenic mode	4:48	78	4:57:40
		#6 Cro and cI DNA binding sites	6:09	86	5:48:32
		#7 Expression of cI	6:03	64	4:39:17
		#8 Cro binding to DNA elements	4:49	63	3:31:41
		#9 Switch from lysogenic to lytic	5:14	58	4:16:23
Protein synthesis Genetic code	2 x 80 min.	#1 Specificity of protein synthesis reaction	4:31	76	4:20:36
		#2 tRNA	3:38	61	3:23:07
		#3 Wobble hypothesis	4:39	64	4:21:18
		#4 reaction of amino acid loading onto tRNA	4:26	72	4:32:57
		#5 initiation factors	5:37	82	6:03:23
		#6 elongation step	5:19	84	5:31:39
		#7 transpeptidation	5:38	76	4:52:43
		#8 Ef-Ts and EF-Tu	7:04	84	6:50:30
		#9 From DNA to mRNA to protein	5:10	74	3:52:13
		#10 regulation ferritin transferrin	11:57	63	3:05:44