

&2035(+ (16,9(352)(66,21\$/ 9,7\$
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6FKRRO RI (GXFDWLRQ
8QLYHUVLW\ RI ODVVDFKXVHWWV /RZHOO
&OLQLFDO \$VVRFLDWLRU
&XUULFXOXP ,QVWUXFWLRQ

\$ ('8&\$7,21 \$1\$&\$'(0,&48\$/),&\$7,216
(GXFDWLRQ

(G ' /DQJXDJH \$UWV /LWHUDF\
8QLYHUVLW\ RI ODVVDFKXVHWWV /RZHOO
)XOO 6FKRODUVKLS

0 \$ (QJOLVK
6DOHP 6WDWH 8QLYHUVLW\
)XOO 6FKRODUVKLS

\$GGLWLRQDO &RXUVHZRUN 0RGHUDWH 6SHFLDO
8QLYHUVLW\ RI ODVVDFKXVHWWV %RVWRQ
)XOO 6FKRODUVKLS

% \$ (QJOLVK
6WRQHKLOO &ROOHJH
3DUWLDO 6FKRODUVKLS

7HDFKLQJ /LFHQVHV
ODVVDFKXVHWWV 'HSDUWPHQW RI (GXFDWLRQ /LFHQV
‡7HDFKLQJ (QJOLVK *UDGHV
‡3ULQFLSDO
‡\$VVLVWV QWHQGHW 'LUHFWRU 5HJLRQDO 97
‡HSDUWPHQW GHDG
‡'LUHFWRU RI 3RVVHFRQGDU\ 7HFKQLFDO 3URJ
‡\$FDGHPLF &RRUGLQDWRU
‡'LUHFWRU RI 9RFDWLRQDO 7HFKQLFDO 3URJUDPV
‡'LUHFWRU RI \$GXOW 9RFDWLRQDO 7HFKQLFDO 3U

\$FDGHPLF ([S 8QLYHUVLW\ 7HDFKLQJ
3UHVHQW
&OLQLFDO \$VVRFLDWLRU 3URIHVVRU &XUULFXOXP
8QLYHUVLW\ RI ODVVDFKXVHWWV /RZHOO &ROOHJH

&OLQLFDO \$VVLVWV 3URIHVVRU &XUULFXOXP
8QLYHUVLW\ RI ODVVDFKXVHWWV (GXFDWLRQ

-R K Q % Q R B U K H V H J R W R Q D W H

/HFWXUHU & XUULFXOXP , QVWUXFWLRQ
8QLYHUVLW\ RI 0DV & R O O H J H V (G X F D W L R Q

\$GMXQFW)DFXOW\ & XUULFXOXP , QVWUXFWLRQ
8QLYHUVLW\ RI 0DV & R O O H J H V (G X F D W L R Q

\$GMXQFW)DFXOW\ (QJOLVK 'HSDUWPHQW
6DOHP 6WDWH (Q Q L Y H U V L W \ & R O O H J H

\$FDGHPLF ([SHUL7HDFK LQJ

(QJOLVK 7HDFKHU *UDGHV
6KDZVKHHQ 7HFKQLFDO +LJK 6FKRRO

5HVH \$ V V K V W D Q W
6DOHP 6WDWH 8QLYHUVLW\

7HDFKLQJ \$VVLVWDQW
6DOHP 6WDWH 8QLYHUVLW\

(QJOLVK 7HDFKHU *UDGHV
/DQGPUN 6FKRRO

% 352)(66,21\$ \$ & 7,9,7,(6

3URIHVVLQRQDO \$ V V R F L D W L R Q

3URIHVVLQRQDO 0HPEHUVKLSV

1HZ (QJODQG /HDJXH RI 0LGGOH 6FKRROV

1DWLRQDO &RXQFLO IRU 7HDFKHUV RI (QJOLVK

,QWHUQDWLRQDO 6RFLHW\ IRU 7HFKQRORJ\ LQ (GXFDW

,QWHUQDWLRQDO 5HDGLQJ \$VVRFLDWLRQ

\$PHULFDQ \$VVRFLDWLRQ RI &ROOHJHV RI 7HDFKHU (GX

0DVVDFKXVHWWV \$VVRFLDWLRQ RI &ROOHJHV IRU 7HDF

1HZ (QJODQG \$VVRFLDWLRQ RI 7HDFKHUV RI (QJOLVK

(DVWHUQ (GXFDWLRQDO 5HVHDFK \$VVRFLDWLRQ

0DVVDFKXVHWWV 7HDFKHUV \$VVRFLDWLRQ

-RKQ %QR BUKH V HJ RWR QDWH

3URIHVVLRQDO 3UHVHQWDWLRQV

1DWLRQDO &RQIHUHQFH 3UHVHQWDWLRQV

7KH 8VH RI)RUFH 7HDFKLQJ \$GROHVFHQWV LQ W

3D% HULU, B-HY" E Q WDWLRQ

(DVWHUQ (GXFDWLRQDO 5HVHDUFK \$VVRFLDWLRQ

WK \$QQXDO &RQIHUHQFH

7UXPEXOO & 7

2FWREHU

7HDFKUHDXPD 1/05, 5D V B 10 a" i EK \$VVRFLDWLRQ HDFKHU

-RKQ %QR BUKH V HJ RMR QDWH

1DUUDWLYH ODQGVFD SHV DV D QHZ IRUP RI GDWD
GHYHORS PHQW RI WHDFKHUV
3DSHU 3UHVHQWHG
ZLWK 'DQLHGRFWRUDO/VWXGHQW
1DWLRQDO &RXQFLO IRU WKH 7HDFKLQJ RI (QJOL
:DVKLQJWRQ '&
1RYHPEHU

\$OO WKLQJV PXVW EH RQH \$Q DQDO\VLV RI DQGL
6LONR V &HUHPRQ\
3DSHU 3UHVHQWHG
8QLYHUVLW\ RI ORQWDQD V &RQIHUHQFH RQ
0DUJLQDOLJHG /LWHUDWXUHV 0LVVRXOD 07
0DUFK

5HJLRQDO VDWGH, &RQIHUHQFH 3UHVHQWDWLRQV

:RUNVKRS
1HZ (QJODQG /HDJXH RI 0LGGOH 6FKRRO
VW \$QQXDO 0LGGOH /HYHO &RQIHUHQFH 2QOLQH
0DUFK
)URP 3URJUDP
0LQGVHW 2YHUWHWRQ V,VIURP DP \$UDQG %
'U -RKQ %URZQ 8QLYHUVLW\ RI 0DVVDFKXVHWWV
&KDQJLQJ RQH V PLQG LV QRW DV VLP SOH DV LW
SRVVLPHUHQFH VVWU\ WKDQ HYHU IRU WHDFKHU
SUDFWLFHV VWUDWHJLV SUDFWLFHV SURWRFR
IDU ,W LV RXU PLQGVHWV WKDW ZLOO WUDQVIRU
LQWR JUHDWHVW SHGDJRJLFDO RSSRUWXQLWLHV

)LHOGWULS DV)LHOG ([SHULHQFH 3UHSDULQJ &D
DQG (PEHG D 7ULS WR %RVWRQ V 0)\$,QWR WKH &
3DSHU SUHVHQWHG
ZLWK 'DQLHGRFWRUDO VWXGHQW 80/
0DVVDFKXVHWWV \$VVRFLDWLRQ RI &ROOHJHV IRU
(GXFDWLRQ &RQIHUHQFH 0DNLQJ &RQQHFWRQV
3UHSDUDWLRQ 3URJUDPV :RUFHQWV HBI W\$K +RO\
2FWREHU

+RZ WHDFKHU LGHQWLW\ DIIHFWV LQVWUXFWLRQ
3DSHU 3UHVHQWHG
0DVVDFKXVHWWV \$VVRFLDWLRQ RI 9RFDWLRQDO S
&RQIHUHQFH 0DUOERUR 0\$
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-RKQ %QR BUKH V HJ RMR QDWH

'HVLQJ 'LIIHUHQWLDWHG /H DUQLQJ (QYLURQPHQV
3DSHU 3UHVHQWHG
0DVVDFKXVHWWV \$VVRFLDWLRQ RI 9RFDWLRQDO
&RQIHUHQFH 0DUOERUR 0\$
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8VLQJ 2QOLQH IRUXPV WR WHDFK ZULWLQJ
3DSHU 3UHVHQWHG
0DVVDFKXVHWWV \$VVRFLDWLRQ RI 9RFDWLRQDO
&RQIHUHQFH XJ KDS OERUR
-XQH

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6WXUEULGJH 0\$
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)LWFKEXUJ 0\$
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)LWFKEXUJ 0\$
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%HVW SUDFWLFHV IRU VSHFLDO HGXFDWLRQ LQFC
3DSHU 3UHVHQWHG
6WRQHKLOO &ROOHJH (GXFDWLRQ 3URMHFW 1F
)HEUXDU\

(GLWRULDO 5HYLHZHU
3UHVHQW
5HYLHZHU IRU HODQG KFDWLRQ

3UHVHQW
([WHUQDO UHYLHZHU IRU &OHYHODQG 6WDWH 8QL
'U 7HG² &KFDLU RI WKH SHHU UHYLHZ FRPPLWWHH
HGXFDWLRQDO QGHUYLFHV

3UHVHQW
([WHUQDO 7H[WERND 5MRQHZHEJOLVKLQJ

-R K Q %Q R B UKH V HJ RWR OOVH

&RQVXOWWVQJIR3U URIHVVL RQDOLVP
6RPHUYLOOH 3XREHJYLFKOROV\$

&RQVXOWWUQJFXOXP
5R[EXU\ 7HQDQWV RI +DUYDUG

&RQVXOWLQJ 3URIHVVL RQDO 'HYHORS PHQW
%XUOLQJWRQ 'D\FDUH %XUOLQJWRQ 0\$

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&RQVXOWWURJHVVL RQDO 'HYHORS PHQW
&DWKROLF &KDULWLHV 3HDERG\ 0\$

&RQVXOWWURJHVVL RQDO 'HYHORS PHQW
*ORXFHVWHU 3X*EOLXF HFMHROV\$

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&RQVXOWLQJ IRU 6WXGHQW %HKDYLRU 3UREC
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9DULRXV 3URIHVVL RQDO 'HYHORS PHQW :RUNV
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.LG↑V &RLQCFHKUHVWHU 0\$

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('8& '\QDPLFV RI &XUULF2XOODLQ & KDQJH
7KLV FRXQVHGHUV PDMRU SHUVSHFWLYHV RQ FXUULF
VWUDWHJLHV LQYROYHG LQ WKH SURFHVV RI FKDQJL

VIL R H Q V G @ D W Q F G S U F V

5HDGLQJ +LJK 6FKRRO
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)LWFKEXUJ 0LGGOH 6FKRRO
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 *URWXRQVW5HEJQ R Q D K 6FKRRO
 1DUUDJDQVHWW 0LGGOH 6FKRRO %DOGZLQYLOOH
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 :KLWWLHU 7HFKQLFDO +LJK 6FKRRO +DYHUKLOO
 6KDZVKHHQ 7HFKQLFDO @HJKL 6FKRRO
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 *DUGQHU +LJK 6FKRRO
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 1RUWK 5HDGLQJ +LJK 6FKRRO
 *UHDWHU /DZUHQFH 7HFKQLFDO +LJK 6FKRRO \$QGRY
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FDQGLGDWHV DV ZHOO DV &XUULFXOXPYDUQRXWUXFWL
PHWKRGV RU HDGLQJLQJURVV WKH FXUULFXOXP
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('8& \$GYDQFHG 20HPLOHU
7KH (G 6 6HPV 6HPDVLWKHFRXUVH LQ WKH (GXFDWLRQ
SURJUDPV LQ &XUULFXOXP DQG ,QWUXFWLRQ (GXFD
DQG /DQJXDQJHGXFDQJH[SHUHQFHFRXUDDD VR WKDW V
ZKR FRPSOHWH WKH FRXUVH WKHFRXUDWVWKHFRXUDWVWKHFRXUDWV
SURMHFW WKDW UHQHFRXUDWVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWV
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('8& &DSVWRQH 3URMHFW 20GYDQFH 3URJUDPV
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GHPRQWKHFRXUDWVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWV
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('8& :ULWLQJ 3URIHVVLRQDO 'HYHORSPHQ
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PHWKRGVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWVWKHFRXUDWV
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7HDFKLQJ FRXUWVWDEURDG
6SULQJ :RIUNVKQSWUXFWKIPVHUJSCBPHLQWEDG WR
VWXG\ WKHLU HGXFDWLRQDO V\WVHP
8QLYHUVLW\ RI ODVDFKXVHWWV /RZHO

7HFKQR6XRPJLW
7KLV FRQIHUHQFH LQWURGXFHG VFKRRO GLVWULFW S
WR PHWKRGV IRU LQWHJUDWLQJ GHYLFH WHFKQRORJY
&XUULFXOXP LVVXHV LQVWUXFWLRQ DQG DVVHVVPHG
ZHUH GLVFXVXUHBI\$WKH %XUOLQJWRQ +LJK 6FKRRO ID
%XUOLQJWRQ ZDV WKH ILUVW VFKRRO GLVWULFW LQ
WHFKQRORJ\ IRU HGXFDWLRQ RQ WKLV VFDOH
%XUOLQJWRQ 3XEOLF 6FKRROV

,QWURGXFWRQ WR 2QOLQH 7HDFKLQJ ZLWK %ODFNEF
ZHHN RQOLQH FRXUVH IRU IDFXOW\ ZKR ZLOO WHDFK
8QLYHUVLW\ RI ODVVDFKXVHWWV /RZHO

&RQIHUHQFHV \$WWHQGHG
(5\$ WK \$QQXDO &7LQXPHDQGH&7
1(/061HZ (QJODQG /HDJXH RI VLVG & B B I G I H K R F O V
%URZQ 8QLYHUVLW\ OLQGLQJLQGHVV &RQIHUHQFH
)XWXUH RI (GXFDFWLRQ&RQIHUHQFH :6-
6(/ 0\$ &RQIHUHQFH 2QOLQH
(5\$ Q\$QQXDO&RQIHUHQFH 0\UWOH %HDFK 9\$
2SHUDWLRQ 6FKRRO 6HFXULW\ &RQIHUHQFH 80/
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\$\$&7\$QQXDO 0HDIW DQJJDV 0\$
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8QLYHUVLWY LWLHV
3UHVHQW
)DFXOW\ 6HQDWH
5HSUHVH QDFWLRQKRRQGXFDWLRQ
0HPEHDFW*3\$&*RJDGDWH 3ROLF\ &RPPLWWHH

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3 UHVHQW

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 0HPEHU JHFXWLYHIO%IF DVHGRFKRR QGXFDWBRIQVHQW
 0HPEHU 063 I&REDUJDLQLQJ 3WHDPQW
 0HPEHU 063 &RUEH DUJDLQLQJ WHDP
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 0HPEHU 063 UPS EDWJDLQLQQAIAH.DMP}
 0HPEHU 8RREDUJDWQIDQJ
 0HPEHU 063 WUKLHYDXQVpD ZB'eiT HZLDH XiWpgD Za"eiTà

-R K Q % Q R B U K H V H U R W H A % " Z

-R K Q %Q R B UKH V HJ RWR QDWH

& RD X W K R U L H G W H K Q F B Q Q K D H S R U W 9 I Z F 8 M K D Q F H O O R U
- D F T X H O L Q H 0 R O R Q K & K D S Q V H R F Q B W H 6 9 L H F Y H 7 H O O R D Q G
(Q W U H S U H Q H X U L D O , Q L W L D W L Y H ' L U H F W R U + R O O \ %)

3 D U W L F I 9 \$ D 8 W H 9 D Q Q G \$ V V H V V P H Q W R I / H D U Q L Q J L Q 8 Q
(G X F D W L R Q 5 X B U K I D F L 6 H G V E L R Q K D U O R W W H 0 D Q G H O O 9
8 Q G H U J J U D G X D W H (G X F D W L R Q

6 H U Y H G : R U W L K E V R I P L W W K I D L U H G E \ - X D U L R Y & K W Q 9 L F
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-R K Q %Q R B UKH V HJ RWR QDWH

3UHVHQW

\$FDGHPLF \$G YLRV LIGJHD QDGSYRQ HW KH GHFODUDWLRQ RI V
HG XFDWLRQ PLQRU RQ FRUDFNH DGHPLH F/W J-RQ"Ö•RQ XFKVM

-R K Q %Q R B UKH V HJ RWR QDWH

\$VVLVWHG 'HDQ \$QLWD *UHHQZRRG DQG D VPDOO WHI
DQG UXQQLQJ WKH *UDGXSHH GEGWRIO RH QRAV FID%ULIRDN
. 6XSHULQWHQGHQWV DQG &XUULFXOXP 'LUHFWRUV
6XSHULQWHQGHQWV IURP DURXQG WKH 6WDWH WR IL
LPSURYLQHJG.XFDWLRQ LQ 0DVVDFKXVHWWV

&ROOHJH RI2SGHCF D R/X R I Q

,QYLWHDG/VURR(FQ9DVLWVHSDUWPHQW)DFXOW\ WR LQW
7UDFN WR WHDFK\$LOQ 3UDQJUDP -RQDWKDQ 6LOYHUPDQ
*RUPOH\ 'U 0DWW +XUZLW] DQG 'U 0DXUHHQ 6WDQW

:RUNHG ZLWK \$VVRFLDWH 3(QRICHLWKR UHSDGWH&K-HQW RI V
\$QWKRQ\ 6]F]HVLXO WR FUHDWH D 3ZRUNLQJ' DOLJQP
FRQWHQW DUHD (QJOLVK FRXUVHV RIIHUNG DW 80/ W
3URIHVVLRQDO 6WDQGDUGV IRU 7HDFKLQJ IRU WKH L

)DFLOLWDFWGHJHD RI &RQWLQXLQIRUGXGOWQIRQQJHELVKDU
0DMRUV ZKR DUH LQWHUHVWHG LQ FDUHHUV LQ 7HDF

7UDLQHG DQ DGMXQFW LQVWUXFWRU DQIGWH WHDFKLO
SUDFWLFXP VXSHUYLVLRQ DQG HYDOXDWLRQ

\$VVLVWHG 'HDQ \$QLWD *UHHQZRRG LQ WKH FUHDWLR
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/HKRXDQGH3KLO %HJHDO

&ROODERUDWHG ZLWK 0DU\ *RUPOH\ (QJOLVK 'HSDUV
VWXGHQWV VHHDFKLOQJ ((GJ0Q7HIXWLQJ &HQWHU
FXUULFQ&FLVWHG KHU ZLWK W:KULWQJ 0LJWKQWHSDUWP

3DUWLFLSDWHGWLQH WKSHDUMPLHQZWRRI (OHPHQWDU\ DQC
(GXFDFWLRQ GULQW XLSGRLEVRVIRUWKHQDO 6WDQGDUGV IR
7HDFKHUV

5HYLHZ RI &\$X3 FLO IRU WKH \$FFUHGLWDWLRQ RI (GX
6WDQGDUGV

-R K Q %Q R B UKH V HJ RWR QDWH

5HYLHZ RI 3\$5&& QHUVKLS IRU \$VVHVVP HQW RI 5HDGL
&DUHHUV 75HMYW H, ZHCP VQJOLVK /DQJXDJH \$UWV 4XHVW
3\$5&& \$VVHVVP HQW

3DUWLF L7S KDW(HG CLLQ/ K 'H S DLUWHP (HCHVQVW

2EVHUY H6Q 7HDFKLQJ \$VVLVWDQW IRU HYDOXDWLRQ S

&RPPXQLW\ \$FWLYLWLHV 5HODWHG WR 3URIHV

\$SSHDUD%OFFVWRQ RQ1GZIFOLQLQLQHCSXREODPWHQWRRO
KWWSV_ZZZ_ERVWRQ_QHZV_ORFVDCR_R_OVRVLEDCRWRPUN_QSV
HQURODPVIRQVZLWSDG_GHPLF_8+%_796+/-_8_2<288_5;5*8)8

*XHVW 6SHDNHU

-R K Q %Q R B U K H V H J R W R Q D V H

6 H U Y H G R Q W K H / D Z U H + Q B H H X E G X F D W F L R R Q D I V * U R X
5 \ D Q 6 R X O L R W L V / D Z U H Q F H + L J K 6 F K R R O ' H S D U W P H Q
1 R U W K H U Q (V V H [& R P P X Q U W W Q & R U Q O H S H ' L U H F W R U 0 D
0 F & D U W K \ \$ F D G H P L F 3 U H S D U D W L R Q 1 R U W K H U Q (V V H
D G Y L V H W K H / D Z U H Q F H H W X F F H P V R Q R V X M Z D I H Q F E I O V W X G
W K H F R O O H J H O H Y H O

6 H U Y H G : R Q + W K H R D U G R I + L J K H U (G X F D W L R Q H) R I F X V * U
% O X P H Q L W K I D O R U R I D G X F D W L R Q V D Q / D Q H 6 H Q L R U ' L U
\$ O L J Q P H Q W D Q G (Q J D J H P H Q W D W 0 D V V D F K X V H W W V
(G X F D W L R Q D V Z H O O D V S U R I H V V R U V D Q G ' H D Q V I U R F
S U R I H V V L R Q D O V X S S R U W I R U S U D F W L F L Q J W H D F K H U V

& R O O H F W H G D F D G H P L F S H U I R U P D Q F H G D W D I R U U H S F
, Q W H U Q D W L R Q D O 5 H D S L Q J \$ V V R F L D W L R Q

& R O O H F W H G D F D G H P L F S H U I R U P D Q F H G D W D I R U U H S F
1 D W L R Q D O & R X Q F L Q Q U R U L V K H D F & K (U V R I

& R O O H F W H G D F D G H P L F S H U I R U P D Q F H G D W D R I Q D O U H S F
& R X Q F L O I R U \$ F F U H G L W D W L R Q R I 7 H D F K H U V R I (G X F D

1 R Q F D G H P L F D Q G 3 U R I H V V L R Q D O \$ F W L Y L W L F

: U R W H D Q G S U H Y H H S W R S R O V D L V O H J W L U G L Q J X Q I X Q C
. H G X F D W L R Q R W K H 6 W D W H / H J L V O D W X U H

0 7 \$ ' H O H J D W H W R \$ Q Q X D O & R Q Y H Q W L R Q